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MARINE CORPS TM 09211A-OR

TECHNICAL MANUAL

OPERATOR AND FIELD MAINTENANCE MANUAL
INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST (RPSTL)
FOR

ARMY KITCHEN MODULE (ASSAULT)
NSN 7360-01-558-3100 (GREEN)
NSN 7360-01-560-5161 (TAN)
MARINE CORPS TRAY RATION HEATING SYSTEM
NSN 7310-01-295-7479

DISTRIBUTION STATEMENT A – Approved for public release; distribution is unlimited.

HEADQUARTERS, DEPARTMENT OF THE ARMY

27 February 2009

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WARNING SUMMARY

This warning summary contains general safety warnings and hazardous materials warnings that must be understood and applied during operation and maintenance of this equipment. Failure to observe these precautions could result in serious injury or death to personnel. Also included are explanations of safety and hazardous materials icons used within the technical manual.

FIRST AID

For first aid treatment, refer to FM 4-25.11.

EXPLANATION OF SAFETY WARNING ICONS

BIOLOGICAL - abstract symbol bug shows that a material may contain bacteria or viruses that present a danger to life or health.

CHEMICAL - drops of liquid on hand shows that the material will cause burns or irritation to human skin or tissue.

ELECTRICAL - electrical wire to arm with electricity symbol running through human body shows that shock hazard is present.

EXPLOSION - rapidly expanding symbol shows that the material may explode if subjected to high temperatures, sources of ignition or high pressure.

EYE PROTECTION - person with goggles represents material that can spray or splatter and cause damage to personnel .

FIRE - flame shows that a material may ignite and cause burns.

HEAVY OBJECT - human figure stooping over heavy object shows physical injury potential from improper lifting technique.

HOT AREA - hand over object radiating heat shows that part is hot and can burn.

MOVING PARTS - human figure with an arm caught between gears shows that the moving parts of the equipment present a danger to life or limb.

EXPLANATION OF SAFETY WARNING ICONS - Continued

POISON - skull and crossbones shows that a material is poisonous or is a danger to life.

VAPOR - human figure in a cloud shows that material vapors present a danger to life or health.

WARNING DESCRIPTIONS

WARNING

For First Aid treatment, refer to FM 4-25.11.

WARNING

Gasoline should **NOT** be used with the TRH or MBU under any circumstance. **Only JP-8 or an approved alternate diesel fuel may be used.** Using gasoline in the TRH or MBU will create a fire danger and potential for explosion. Failure to observe safety precautions may result in injury or death to personnel.

WARNING

Never attempt to heat cooking or frying oil of any kind in the TRH. The TRH should only be used to heat water in accordance with the operating instructions outlined in this manual. Using oil in the TRH will create a fire danger. Failure to observe warnings may result in injury or death to personnel.

WARNING

Do not attempt to connect a fuel line to the TRH or MBU in the vicinity of any open flame. Ensure that the fuel hose connections are made properly to avoid fuel spillage. Prevent a possible fire hazard by having absorbent materials or fuel mats on hand to absorb any spillage. Failure to observe safety precautions may result in injury or death to personnel.

WARNING

Electrical high voltage cannot be seen but it can kill you, render you unconscious, or severely burn you. Electricity is unlike most other dangerous things you can come in contact with because it gives no warning and no symptoms to be wary of. To ensure your safety and that of other maintenance personnel, always disconnect equipment from external power before attempting maintenance tasks.

WARNING

Prior to performing maintenance on any Assault Kitchen components, personnel will remove all watches, rings, and jewelry. Failure to do so could result in serious personal injury or death.

WARNING DESCRIPTIONS – CONTINUED

WARNING

During operation, the TRH and MBU produce harmful carbon monoxide (CO) and other gases. Carbon monoxide is a colorless, odorless, and tasteless gas. Mild cases of carbon monoxide poisoning can cause symptoms such as nausea, dizziness or headaches. Severe cases of carbon monoxide poisoning can result in brain damage, heart damage or death. Remember that although CO has no telltale odor, it may mix with other odors that mask its presence; therefore, CO can be present within a mix of seemingly harmless odors. To prevent CO poisoning, ensure that the TRH and MBU operating spaces are well ventilated during burner operation. Under no circumstances, should the TRH be operated in any enclosure with all vents closed.

WARNING

Do not attempt service procedures on a TRH burner or MBU that has recently been in operation. Let the burner cool down before performing these procedures. Failure to observe safety precautions may result in injury or death to personnel.

WARNING

HIGH VOLTAGE is used in the operation of this equipment. **DEATH ON CONTACT** may result if personnel fail to observe safety precautions. Never work on electrical equipment unless there is at least one other person nearby who is familiar with the operation and hazards of the equipment. That person should also be competent in giving first aid. Ask maintenance personnel about any hazardous features of the TRH or MBU prior to doing any maintenance. Whenever possible, external power must be shut off before performing any maintenance. Be careful not to contact high-voltage connections when removing, installing or operating this equipment. Whenever possible, keep one hand away from the equipment to reduce the hazard of current flowing through vital organs of the body. Voltages as low as 50 volts may cause death.

For artificial respiration, refer to FM 21-11.

Do not stand in water while handling live power cords or electrical shock may result. Position all power cables so that they are out of the way during operation and are not in water.

WARNING

The MBU weighs approximately 58 pounds fully fueled (26.3 kg). Two persons must carry the MBU, lifting with legs, not back, to prevent injury.

WARNING

The TRH Lid weighs approximately 45 pounds. When performing maintenance on the TRH lid two persons must carry the lid, lifting with legs, not back, to prevent injury.

WARNING

The TRH weighs approximately 320 pounds when empty and 525 pounds when full. Proper lifting technique is required to prevent damage to equipment and personnel. Always drain water tank before lifting or moving TRH. Use a forklift or other material handling equipment to place or remove the TRH on the back of a HMMWV or trailer. If no lifting equipment is available 6 persons must be used to move the TRH, lifting with legs, not back, to prevent injury. Do not use the lid handles to move the TRH. If using personnel to move the TRH, use the two lift bars on the TRH.

WARNING DESCRIPTIONS – CONTINUED

WARNING

Do not turn TRH power on until heater tank is filled with water above the low water sensor.

WARNING

Tank water may be scalding and could cause serious injury. Remain clear of drain pipe or drain hose when draining hot water.

WARNING

Always use the exhaust elbow to direct hot exhaust away from personnel and equipment. Do not touch the TRH exhaust elbow, as it may be hot. Failure to observe warnings may result in injury to personnel.

WARNING

Never use the “BOIL” mode to prepare rations as it bypasses built in safety features and may cause personnel to be burned by vented steam or scalding can contents. Never leave the TRH unattended when operating in the “BOIL” mode. Water may ”boil over” causing injury to personnel.

WARNING

Do not lubricate the hinges of the TRH lid. Failure to observe warnings may result in food contamination and possible injury to personnel.

WARNING

Use the TRH “BOIL” mode only for short periods of time. Extended use of the “BOIL” mode produces excessive steam through the pressure relief hole in the TRH lid. Excessive pressure also may accumulate in canned food containers. Failure to observe warnings may result in injury to personnel.

WARNING

Before resetting the power inverter circuit breaker, make sure the TRH red, pull-on/push-off switch is in the OFF position. This will prevent inadvertent burner ignition.

WARNING

Before removing the TRH Burner from the TRH, ensure the TRH Red, Pull-ON/Push-OFF switch is in the OFF position and the TRH electrical control box is unplugged from power source to prevent electrical shock and inadvertent burner ignition.

WARNING

Keep the TRH tank lid closed whenever possible to prevent contamination and accidental burning. Failure to observe warnings may result in injury to personnel.

WARNING DESCRIPTIONS – CONTINUED

WARNING

#10 Cans become pressurized, to prevent injury punch a hole in the center of the can lid prior to opening with the can opener.

WARNING

Keep face and hands away from TRH or wear eye protection when performing maintenance on the fuel system. Substances may spray or splatter during maintenance actions causing injury to personnel.

WARNING

The tray rack and heated tray rations are hot. Wear protective gloves when handling hot tray packs, #10 cans, and UGR rations. Exercise care when opening the lid of the tray ration heater. Placing hands into water, even when protected with gloves, could result in injury to personnel.

WARNING

When using the diagnostic test box to test the TRH Burner, be careful to observe the condition of the test switches on the test box. All switches shall be in the OFF (O) position. Failure to observe this warning may cause unexpected TRH burner start-up resulting in injury or death to personnel.

WARNING

DO NOT touch hot metal surfaces with bare hands. Allow surfaces to cool or wear protective gloves when performing maintenance on a hot metal surface. Failure to observe warnings may result in injury or death to personnel.

WARNING

Be aware that fuel expands as the temperature rises - do not store TRH or fuel cans when full of fuel, where it is exposed to the sun for long periods. Failure to observe warnings may result in injury or death to personnel.

WARNING

Use caution when draining fuel from the TRH Burner. Fuel draining from the TRH Burner fuel sump may flow rapidly. This could cause fuel spatter or spills on skin or clothing. Keep eyes protected and wash any clothing, equipment, or skin that is contaminated by fuel.

WARNING

During the Ignition Transformer test, it is necessary to look into the TRH Burner flame tube to observe a spark. When observing the flame tube for existence of a spark be sure to stay as far away as possible from the flame tube. Failure to observe this warning may result in injury or death to personnel.

WARNING

Ensure the Mercury Tilt Switch is disposed of properly IAW unit SOP and local directives. Mercury is highly toxic to the environment and must be contained to prevent contamination. Do not open, incinerate, or bury the switch.

HAZARDOUS MATERIALS WARNINGS

DESICCANT, ACTIVATED, MIL-D-3464

Activated Desiccant, MIL-D-3464 is primarily a dust irritation hazard to the eyes and respiratory tract. Use safety glasses or goggles and a NIOSH/MSA approved dust mask when handling. For first aid, flush eyes for 15 minutes with clean water and wash skin with soap and water. Consult with local bioenvironmental engineer for disposal of materials and empty containers.

DETERGENT, GENERAL PURPOSE, MIL-D-16791

General Purpose Detergent, MIL-D-16791, is an irritant to the skin and eyes. Rubber or neoprene gloves and eye protection required. Keep off eyes, skin and clothing. Do not ingest. For first aid, flush eyes with plenty of water. If ingested, induce vomiting. Consult with local bioenvironmental engineer for disposal of materials and empty containers.

OIL, PENETRATING, A-A-50493

Penetrating Oil, A-A-50493, is mildly irritating to skin or eyes. Skin and eye protection required. Keep off of eyes, skin and clothing. Do not ingest. For first aid, flush eyes for 15 minutes with water. Wash skin with soap and water. Consult with local bioenvironmental engineer for disposal of materials and empty containers.

TURBINE FUEL, AVIATION, JP-8 (NATO F-34), MIL-DTL-83133

Turbine Fuel, Aviation, Grades JP-8 (NATO F-34), MIL-DTL-83133, is extremely flammable. Prolonged skin contact may cause dermatitis. Overexposure could cause headache, dizziness, nausea, loss of consciousness, or death. Keep away from heat, sparks and open flames. Gloves and safety glasses/goggles required. Do not ingest. Use in well ventilated area. Keep off of eyes, skin, and clothing. First aid: flush eyes with water for 15 minutes, wash skin with soap and water. If ingested, do not induce vomiting and seek medical attention. Consult with local bioenvironmental engineer for disposal of materials and empty containers.

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TECHNICAL MANUAL

OPERATOR AND FIELD MAINTENANCE MANUAL INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST (RPSTL) FOR

ARMY KITCHEN MODULE, (ASSAULT) NSN 7360-01-558-3100 (GREEN) NSN 7360-01-560-5161 (TAN)

MARINE CORPS TRAY RATION HEATING SYSTEM (TRHS) NSN 7310-01-295-7479

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know.

(A) Mail your letter or DA Form 2028 (Recommended Changes to Publications and Blank Forms), located in the back of this manual directly to: Commander, U.S. Army TACOM Life Cycle Management Command, ATTN: AMSTA-LC-LMPP / TECH PUBS, 1 Rock Island Arsenal, Rock Island, IL 61299-7630. You may also send in your recommended changes via electronic mail or by fax. Our fax number is DSN 793-0726 and commercial number (309) 782-0726. Our e-mail address is TACOMLCMC.DAForm2028@us.army.mil.

(MC) By NAVMC form 10772 directly to Commander, Marine Corps Systems Command, Attn: Assistant Commander Acquisition and Logistics (LOG/TP), 814 Radford Boulevard, Suite 20343, Albany, Georgia 31704-0343. You may also send in your recommended changes via electronic mail or by fax. Our e-mail address is mbmatcommarlogbases@matcom.usmc.mil.

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Alphabetical Index

HOW TO USE THIS MANUAL

HOW TO OBTAIN TECHNICAL MANUALS

When a new system is introduced to the Army inventory, it is the responsibility of the receiving units to notify and inform the Unit Publications Clerk that a Technical Manual is available for the new system. Throughout the life cycle of the new system, the Publications Proponent will also provide updates and changes to the Technical Manual.

To receive new Technical Manuals or change packages to fielded Technical Manuals, provide the Unit Publications Clerk the full Technical Manual number, title, date of publication, and number of copies required. The Unit Publications Clerk will then justify the request through the Unit Publications Officer. When the request is approved, DA Form 12-R is used to order the Technical Manual from the Army Publishing Directorate (APD). Obtain the form and request a publications account from the APD Web site at http://www.apd.army.mil. Once on the Website, click on the "Orders/Subscriptions/Reports" tab. From the dropdown menu, select "Establish an Account," then select "Tutorial" and follow the instructions in the tutorial presentation.

Complete information for obtaining Army publications can be found in DA PAM 25-33.

ORGANIZATION OF THIS MANUAL

In this manual, primary chapters appear in upper case/capital letters; work packages are presented in numeric sequence, e.g., 0001, 0002; paragraphs within a work package are not numbered and are presented in a titled format. For a first level paragraph, titles are in all upper case/capital letters, e.g., FRONT MATTER. Subordinate paragraph titles will have the first letter of the first word of each principle word all upper case/capital letters, e.g., Manual Organization and Page Numbering System. The location of additional material that must be referenced is clearly marked. Illustrations supporting maintenance procedures/text are located underneath, or as close as possible to, their referenced paragraph.

FRONT MATTER. Front matter consists of front cover, warning summary, title block, table of contents, and how to use this manual page.

CHAPTER 1 – GENERAL INFORMATION, EQUIPMENT DESCRIPTION, AND THEORY OF OPERATION. Chapter 1 Contains introductory information on the Army Assault Kitchen and USMC Tray Ration Heating System and its associated equipment as well as theory of operation.

CHAPTER 2 – OPERATOR INSTRUCTIONS. Chapter 2 provides operator procedures required for use of the Army Assault Kitchen and USMC Tray Ration Heating System and its by the operator including description and use of controls and indicators, operational deployment cycles, and cleaning.

CHAPTER 3 –TROUBLESHOOTING MASTER INDEX. Chapter 3 provides a troubleshooting index listing all of the problems you are likely to encounter with the Army Assault Kitchen and USMC Tray Ration Heating System and its as well as references to the individual troubleshooting procedure work packages.

CHAPTER 4 – OPERATOR TROUBLESHOOTING PROCEDURES. Chapter 4 provides troubleshooting procedures authorized for operator level maintenance personnel.

CHAPTER 5 – SERVICE TROUBLESHOOTING PROCEDURES. Chapter 5 provides troubleshooting procedures authorized for service level maintenance personnel.

CHAPTER 6 – OPERATOR MAINTENANCE INSTRUCTIONS. Chapter 6 provides maintenance procedures authorized at the operator level that include service upon receipt, preventative maintenance checks and services, repair and replacement of key components, and preparation for storage and shipment.

CHAPTER 7 – SERVICE MAINTENANCE INSTRUCTIONS. Chapter 7 provides maintenance procedures authorized at the unit level that includes repair and replacement of key components.

CHAPTER 8 – FIELD MAINTENANCE INSTRUCTIONS. Chapter 8 provides maintenance procedures authorized at the field level that includes repair and replacement of key components.

CHAPTER 9 – PARTS INFORMATION. Chapter 9 contains Repair Parts and Special Tools List (RPSTL), national stock number index and part number index.

CHAPTER 10 – SUPPORTING INFORMATION. Chapter 10 contains references, maintenance allocation chart and expendable and durable items list.

REAR MATTER. Rear matter consists of alphabetical index, DA Form 2028, authentication page, and back cover.

Manual Organization and Page Numbering System. The manual is divided into eleven major chapters that detail the topics mentioned above. Within each chapter are work packages covering a wide range of topics. Each work package is numbered sequentially starting at page 1. The work package has its own page numbering scheme and is independent of the page numbering used by other work packages. Each page of a work package has a page number of the form XXXX-YY where XXXX is the work package number (e.g. 0010 is work package 10) and YY represents the number of the page within that work package. A page number such as 0010-1/(2 Blank) means that page 1 contains information but page 2 of that work package has been intentionally left blank.

Finding Information. The table of contents permits the reader to find information in the manual quickly. The reader should start here first when looking for a specific topic. The table of contents lists the topics, figures, and tables contained within each chapter and the work package sequence number where it can be found.

Example: If the reader were looking for instructions on Operating Under Usual Conditions, the table of contents indicates that information on operation can be found in chapter 2. Scanning down the listings for chapter 2, information on how to operate the Army Assault Kitchen and USMC Tray Ration Heating System and its can be found in WP 0005, Operation Under Usual Condition (i.e. Work Package 5).

An Alphabetical Index can be found at the back of the manual; specific topics are listed with the corresponding work package number.

CHAPTER 1

GENERAL INFORMATION, EQUIPMENT DESCRIPTION, AND THEORY OF OPERATION FOR ASSAULT KITCHEN

OPERATOR AND FIELD MAINTENANCE

GENERAL INFORMATION

SCOPE

Type of Manual

This technical manual provides Operator and Field maintenance instructions for the Army Assault Kitchen, NSNs 7360-01-558-3100 (Green) and 7360-01-560-5161 (Tan), and the USMC Tray Ration Heating System, NSN 7310-01-295-7479. This manual also provides a Repair Parts and Special Tools List (RPSTL), located in WP 0052 through WP 0059.

Model Number and Equipment Name

Army Part Number AK-0100, ASSAULT KITCHEN (Green)
Army Part Number AK-0100-1, ASSAULT KITCHEN (Tan)
USMC Part Number TRH-0100, TRAY RATION HEATING SYSTEM

NOTE

The Army Assault Kitchen and Marine Corps Tray Ration Heating System are similar systems based on the same food service equipment. For the purposes of this manual, the Assault Kitchen will be used as the nomenclature for both systems unless otherwise specified.

Purpose of Equipment

The Assault Kitchen and Tray Ration Heating System provide capabilities to deliver hot, tray ration food service to soldiers in remote locations. Each system is highly mobile and has the ability to serve 250 tray ration meals in one location with a combined capability to serve 500 tray ration meals in one day.

MAINTENANCE FORMS, RECORDS, AND REPORTS

(A) Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA PAM 750-8, The Army Maintenance Management System (TAMMS) Users Manual.

(MC) Maintenance forms and records used by Marine Corps Personnel are prescribed by TM 4700-15/1.

REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR)

(A) If your Assault Kitchen needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design or performance.

If you have Internet access, the easiest and fastest way to report problems or suggestions is to go to https://aeps.ria.army.mil/aepspublic.cfm (scroll down and choose the “Submit Quality Deficiency Report” bar). The Internet form lets you choose to submit an Equipment Improvement Recommendation (EIR), a Product Quality Deficiency Report (PQDR) or a Warranty Claim Action (WCA).

You may also submit your information using an SF 368 (Product Quality Deficiency Report). You can send your SF 368 via e-mail, regular mail, or facsimile using the addresses/facsimile numbers specified in DA PAM 750- 8, The Army Maintenance Management System (TAMMS). We will send you a reply.

(MC) For Marine Corps users: Quality Deficiency Reports (QDR) shall be submitted on SF 368 in accordance with MCO 4855.10. A reply will be furnished to you.

CORROSION PREVENTION AND CONTROL (CPC)

Corrosion Prevention and Control (CPC) of Army materiel is a continuing concern. It is important that any corrosion problems with this item be reported so that the problem can be corrected and improvements can be made to prevent the problem in future items.

Corrosion specifically occurs with metals. It is an electrochemical process that causes the degradation of metals. It is commonly caused by exposure to moisture, acids, bases, or salts. An example is the rusting of iron. Corrosion damage in metals can be seen, depending on the metal, as tarnishing, pitting, fogging, surface residue, and/or cracking.

Plastics, composites, and rubbers can also degrade. Degradation is caused by thermal (heat), oxidation (oxygen), solvation (solvents), or photolytic (light, typically UV) processes. The most common exposures are excessive heat or light. Damage from these processes will appear as cracking, softening, swelling, and/or breaking.

SF Form 368, Product Quality Deficiency Report should be submitted to the address specified in DA PAM 750-8, The Army Maintenance Management System (TAMMS) Users Manual.

OZONE DEPLETING SUBSTANCES (ODS)

No Class 1 Ozone Depleting Substances have been identified for use with the Assault Kitchen.

DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE

Objective

Methods of destruction used to inflict damage on food service equipment should make it impossible to restore equipment to a usable-condition in a combat zone, by either repair or cannibalization.

Authority

Destruction of food service equipment that is in imminent danger of capture by an enemy is a command decision that must be made by the commander, or equivalent.

Implementation Plan

Destruction of Army materiel to prevent enemy use shall be in accordance with TM 750-244-3.

PREPARATION FOR STORAGE AND SHIPMENT

For storage and shipment, refer to WP 0048 of this manual.

WARRANTY INFORMATION

The TRH Burner and TRH Electronics are warranted for one year. The warranty starts on the date found in block 23 of DA Form 2408-9, Equipment Control Record. Report all defects to your supervisor, who will take appropriate action.

NOMENCLATURE CROSS-REFERENCE LIST

Table 1. Nomenclature Cross-Reference List.

Common Name	Official Nomenclature
Assault Kitchen	Assault Kitchen Module
Butt Connector	Splice Conductor
Fuel Filter	Fluid Filter Element
Insulated Food Carrier	Insulated Food Transporter
Side Loading Pan Carrier	Insulated Food Container
Tray Rations	UGR – H&S
TRH Burner	Multi-Fuel Burner
TRH Burner Control Box	Flame Safeguard Control
TRH Burner Compressor Head	Gasket
Photocell	Photo Semiconductor Device
TRH Tank Lid Gasket	Rubber Strip
Light Tactical Trailer	M1101 or M1102 Trailer
Pull-ON/Push-OFF knob	Push-Pull Light Switch

LIST OF ABBREVIATIONS AND ACRONYMS

Table 2. List of Abbreviations and Acronyms.

Abbreviation/Acronym	Meaning
A	Ampere
(A)	Army Only
AC	Alternating Current
AK	Assault Kitchen
APD	Army Publishing Directorate
BOI	Basis of Issue
BTU	British Thermal Unit
C	Celsius
CAGEC	Commercial and Government Entity Code
cfm	Cubic Feet Per Minute
CK	Containerized Kitchen
cm.	Centimeter
CO	Carbon Monoxide
CPC	Corrosion Prevention and Control
DA	Department of the Army
DC	Direct Current
DFA	Diesel Fuel Arctic
DPDT	Double Pole, Double Throw
EA	Each
EIR	Equipment Improvement Recommendation
EDS	Electrostatic Discharge Sensitive
F	Fahrenheit
FSC	Federal Supply Classification
ft.	Feet
Gal	Gallon(s)
GFCI	Ground Fault Circuit Interrupter
GND	Ground
hr	Hour(s)
Hz	Hertz
IAW	In Accordance With
IBD	Insulated Beverage Dispenser
ID	Identification
IFC	Insulated Food Carrier
in.	Inch(es)
inHg	Inches of Mercury
IP	In-Process Inspector
HMMWV	High Mobility Multipurpose Wheeled Vehicle

LIST OF ABBREVIATIONS AND ACRONYMS - CONTINUED

Table 2. List of Acronyms and Abbreviations - Continued.

Abbreviation/Acronym	Meaning
KG	Kilograms
LED	Light Emitting Diode
Lbs	Pounds
LTT	Lightweight Tactical Trailer
MAC	Maintenance Allocation Chart
MAM	Maintenance Advisory Message
MBU	Modern Burner Unit
(MC)	Marine Corps Only
MKT	Mobile Kitchen Trailer
mm	millimeter
MOD	Model
MOS	Military Occupational Specialty
MTOE	Modified Table of Organization and Equipment
MWO	Modification Work Order
NATO	North Atlantic Treaty Organization
NIIN	National Item Identification Number
NLT	No Later Than
No.	Number
NSN	National Stock Number
OD	Olive Drab
oz.	Ounces
PIS	Placed In Service
PMCS	Preventive Maintenance Checks and Services
PPE	Personal Protective Equipment
PPM	Parts Per Million
PQDR	Product Quality Deficiency Report
PSI	Pounds per Square Inch
QD, QDC	Quick Disconnect Coupling
QDR	Quality Deficiency Reports
qt	quart
Quadcon	Quadruple Container
RFI	Radio Frequency Interference
RPSTL	Repair Parts and Special Tools List
RTV	Room Temperature Vulcanization
SATS	Standard Automotive Tool Set
SF	Standard Form
SICGARS	Single Channel Ground and Airborne Radio System
SLPC	Side Loading Pan Carrier
SMR	Source, Maintenance and Recoverability
SOP	Standard Operating Procedure
SOUM	Safety Of Use Message
TAMMS	The Army Maintenance Management System
TB	Technical Bulletin
TDA	Table of Distribution and Allowances
TDR	Transportation Discrepancy Report
TM	Technical Manual
TMDE	Test Measurement and Diagnostic Equipment
TRH	Tray Ration Heater
TRHS	Tray Ration Heating System
UGR – H&S	Unitized Group Ration – Heat and Serve
U/M	Unit of Measure
UOC	Usable on Code
UV	Ultra Violet

LIST OF ABBREVIATIONS AND ACRONYMS - CONTINUED

Table 2. List of Acronyms and Abbreviations - Continued.

Abbreviation/Acronym	Meaning
V	Voltage
VAC	Volts, Alternating Current
VDC	Volts, Direct Current
W	Watt
WCA	Warranty Claim Action
WP	Work Package

QUALITY OF MATERIAL

Material used for replacement, repair, or modification must meet the requirements of this manual. If qualities of material requirements are not stated in this manual, the material must meet the requirements of the drawings, standards, specifications, or approved engineering change proposals applicable to the subject equipment.

SAFETY, CARE AND HANDLING

Use care in handling the components of the Assault Kitchen as exposed metal parts may cause injury. The Tray Ration Heating System (TRHS) and Modern Burner Unit (MBU) contained in the Assault Kitchen use flammable fuels that may cause serious injury if improperly handled. Always pay attention to the warnings, cautions, and notes contained in this manual. Ensure you read and understand their content to prevent serious injury to yourself and others, or damage to equipment.

COMMON TOOLS AND EQUIPMENT

For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE), CTA 50-970, Expendable/Durable Items (Except Medical, Class V, Repair Parts and Heraldic Items), CTA 50-909, Field and Garrison Furnishings and Equipment or CTA 8-100, Army Medical Department Expendable/Durable Items, as applicable to your unit.

SUPPORTING INFORMATION FOR REPAIR PARTS, SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT

TMDE, and support equipment are required. Refer to the Maintenance Allocation Chart (MAC) in WP 0062 for a listing of maintenance items and tools or test equipment. Refer to the Repair Parts and Special Tools List (RPSTL) in WP 0052 through WP 0059 for details concerning repair parts.

REPAIR PARTS AND SPECIAL TOOLS LIST (RPSTL)

Repair parts are listed and illustrated in WP 0052 through WP 0059 of this manual.

WARNINGS, CAUTIONS AND NOTES

Be alert and note WARNINGS, CAUTIONS, and NOTES. These provide for safe operation of the equipment, and protect you and your equipment from injury and damage.

END OF WORK PACKAGE

OPERATOR AND FIELD MAINTENANCE

EQUIPMENT DESCRIPTION AND DATA

EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES

The Assault Kitchen is a vehicle deployed food service system with heat-on-the-move capabilities to serve hot tray ration meals in remote areas.

Characteristics

- Deployed from a M1101 or M1102 Cargo Trailer.
- Uses a Tray Ration Heater (TRH) to heat rations for food service in a short amount of time. Uses insulated beverage and food containers to store rations and beverages for service at multiple feeding locations.
- Each AK comes with a spare TRH Burner assembly for continued use in case of equipment damage or failure.
- Army systems use a Modern Burner Unit (MBU) and Stockpot Cradle Assembly to assist in preparation of hot meals and warming beverages.

Capabilities and Features

- Can provide hot meal service for 250 meals at a feeding site and up to 500 meals in a ration day
- Heats rations while on the move to feeding sites to allow quick feeding upon site arrival.
- The TRH includes thermostatic control and safety features for added protection against inadvertent start-up, excessive tilt, or electrical short.

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS

Tray Ration Heater (TRH)

The Tray Ration Heater is located in the cargo bed of the HMMWV or trailer, depending on system configuration. The TRH consists of a 30-gallon capacity heater tank; hinged, latching lid with lockable arm; stabilizing skids and shock mounts; drain valve; electrical controls; and TRH Burner assembly. The TRH electrical system uses 120 VAC, 60 Hz, single-phase current, supplied by a Power Inverter that connects to a 24 VDC vehicle electrical system. The TRH burner assembly maintains the TRH tank water between 180°F and 200°F.

Tool and Utensil Kits

The Assault Kitchen comes equipped with tools, utensils, and spare parts needed to maintain and operate the system. The maintenance kit and tool kit are located in the cargo bed of the trailer, depending on system configuration, and contain tools and spare parts required to service the TRH. The tool kit can be used to install and replace components in the system. The cooking utensils kit contains cooking utensils used for serving of rations.

(A) Modern Burner Unit (MBU)

The Modern Burner Unit (MBU) is a lightweight modular system used as a primary heat source for the kitchen and sanitation equipment found within all Army field feeding systems and is employed in the Assault Kitchen for the heating of water in an equipped stockpot cradle assembly.

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS - CONTINUED

(A) Additional Components

Additional Kitchen Components for Army systems consists of insulated food containers, side loading pan carriers, insulated beverage dispensers, an ice chest, field tables, water cans, fuel cans, tray pack handling tools, and thermal gloves.

(MC) Additional Components

Additional Kitchen Components for Marine Corps systems consists of side loading pan carriers, insulated beverage dispensers, field tables, a fuel can, tray pack handling tools, and thermal gloves.

DIFFERENCES BETWEEN MODELS

Table 1. Differences Between Models.

Item/Component	Applicable Service	
	Army	USMC
TRH Tank with flange		X
TRH Tank without flange	X	X
Male Connector on TRH	X	
Female Connector on TRH		X
Male Connector on Power Cord		X
Female Connector on Power Cord	X	
MBU	X	

EQUIPMENT DATA FOR ASSAULT KITCHEN COMPONENTS (ARMY ONLY)

Table 2. Tray Ration Heater (TRH) (Army Only).

WEIGHT:	
TRH Empty	320 lbs (141 Kg)
TRH With Tray Rations and Water	560 lbs (193 Kg)
DIMENSIONS:	
Height	25.5 in (64.7 cm)
Length	53.0 in (134.6 cm)
Width	23.0 in (58.4 cm)
CAPACITY	
Water	30 gal
Tray Rations	24
FUEL CONSUMPTION:	
Rate of fuel consumption:	
Operating at maximum firing rate:	0.5 gal (1.89 l)/hr
TRHS continuous operation (5 gallon fuel tank)	10 hrs
FUEL REQUIREMENTS	JP-8, JP-5, DFA, Kerosene
ELECTRICAL REQUIREMENTS	120 VAC
ENVIRONMENTAL:	
Operating temperatures	–25 °F to +125 °F (–32°C to +52°C)

Table 3. TRH Inverter (Army Only).

ELECTRICAL CHARACTERISTICS:	
Output Power.	300 W
Output Voltage.	120 VAC, 60 Hz
Input Voltage	24 VDC
WEIGHT.	15.7 lbs.

Table 4. Modern Burner Unit (MBU) (Army Only).

WEIGHT:	
MBU-V3 Fully fueled	60 lbs (27.2 Kg)
MBU-V3 Without fuel	42 lbs (19.1 Kg)
DIMENSIONS:	
Height	9.75 in (25 cm)
Depth	19 in (48 cm)
Width	23 in (58 cm)
FUEL CAPACITY (Usable)	2 US gal (7.6 lt)
INPUT CONNECTORS:	
Fuel	Parker Double Shut-off Coupling, BH2-60Y
FUEL CONSUMPTION:	
Rate of fuel consumption:	
Operating at maximum firing rate:	0.34 gal (1.29 l)/hr
Operating at minimum firing rate:	0.1 gal (0.38l)/hr
MBU-V3 continuous operation (full fuel tank) (setting dependent)	6 hrs to 20 hrs
OUTPUTS:	
MBU-V3 Heat (setting dependent)	15,000 to 52,000 BTU/hr
Carbon monoxide (setting dependent)	50 to 120 ppm
FUEL REQUIREMENTS	JP-8
ELECTRICAL REQUIREMENTS	22 - 29.5 V DC
ENVIRONMENTAL:	
Operating temperatures	–25°F to +125°F (–32°C to +52°C)
Operating elevations to 14,000 ft above sea level	

EQUIPMENT DATA FOR ASSAULT KITCHEN COMPONENTS (ARMY ONLY) - CONTINUED

NOTE

Cargo straps are not part of the tool kit but may be stored there due to space limitations.

Table 5. Tool Kit (Army Only).

CONTENTS:

Hammer, Hand	1
Key Set, Socket Head Screw	1
Knife, Utility	1
Nut Driver (7/16”)	1
Pliers, Needle Nose	1
Pliers, Slip Joint	1
Ratchet Extension (6”)	1
Ratchet Handle	1
* Screwdriver, Cross Tip	1
* Screwdriver, Flat Tip (1/8”)	1
Screwdriver, Flat Tip (3/16”)	1
Socket, (7/16”)	1
Socket, (9/16”)	1
Wrench, Adjustable	1
* Wrench, (10 mm)	1
* Wrench, (11 mm)	1
* Wrench, (5/8”)	1
Wrench, Open End (9/16”)	1
Wrench, Open End (11/16”)	1
WEIGHT	20 lbs

***** TRH Burner Tools from Maintenance Kit.

Table 6. Utensil Kit (Army Only).

CONTENTS:

Bar, Divider, IFC	7
Can Opener	1
Can Opener Base	1
Can Opener Blade	2
Dipper, Kitchen	1
Gloves, Rubber Insulated	4
Knife, Cooks 8 in	2
Knife, Small	2
Ladle, 4 oz.	2
Ladle, 6 oz.	2
Snips, Tin	1
Spatula	3
Spoon, Perforated, 15”	6
Spoon, Serving, 13”	9
Thermometer, Pocket	4
Tongs, 9”	6
Whip, Wire	1
WEIGHT	32 Lbs

EQUIPMENT DATA FOR ASSAULT KITCHEN COMPONENTS (ARMY ONLY) - CONTINUED

Table 7. Maintenance Kit (Army Only).

CONTENTS:	
Atomizing Chamber with igniter	1
Burner, Spare with Burner Control Box	1
Burner Control Box	1
Burner Test Power Cord	1
Compressor Air Filter	1
Compressor O-Ring and Piston Ring Assembly	1
Compressor Pressure Gauge	1
Cotter Pin, 18-8 Stainless Steel	2
TRH Burner Diagnostic Test Box	1
Fuel Filter	1
Fuel Pump	1
Fuel Pump Pressure Gauge	1
Fuel Pump Vacuum Gauge	1
Gasket and O-Ring Kit, Assorted	1
O-Ring, 2.4 mm x 4.3 mm	2
O-Ring, 2.5 mm x 9 mm	2
O-Ring, 2.5 mm x 13 mm	1
O-Ring, 1.6 mm x 4.1 mm	1
Flow Control Module Gasket	1
Gauge Adapters	2
Hose Clamp, 7/32” to 5/8” Diameter	2
Igniter, Spare	1
Ignition Transformer	1
Lanyard Loop End, Stainless Steel	1
Nylon Pump Coupling	1
Photo Cell Cable	1
Photo Cell	1
Photo Cell Socket	1
WEIGHT	51.5 lbs

Table 8. Insulated Beverage Dispenser (Army Only).

DIMENSIONS:	
Height	24.3 in (62 cm)
Depth	16.6 in (42 cm)
Width	9 in (23 cm)
CAPACITY	
Volume	4.75 gal. (18 L)
WEIGHT	15 lbs (empty) / 50 lbs (full)

Table 9. Side Loading Pan Carrier (Army Only).

DIMENSIONS:	
Height	25 in (63.5 cm)
Depth	18.2 in (45.7 cm)
Width	25.8 in (65.5 cm)
CAPACITY	
Volume	60 qt. (57 L)
Tray Rations	16
WEIGHT	32 lbs (empty) / 140 lbs (full)

EQUIPMENT DATA FOR ASSAULT KITCHEN COMPONENTS (ARMY ONLY) - CONTINUED

Table 10. Insulated Food Container (IFC) (Army Only).

DIMENSIONS:	
Height	8.2 in (20.8 cm)
Depth	17.5 in (44.5 cm)
Width	24.8 in (63 cm)
CAPACITY	
Volume	20 qt. (19 L)
Tray Rations	4
WEIGHT	26 lbs (empty) / 44 lbs (full)

Table 11. MBU Accessory Kit (Army Only).

CONTENTS:	
3-foot Power Cable	1
25-foot Power Cable w/ NATO plug	1
Fuel Can Adapter	1
WEIGHT	15 lbs

EQUIPMENT DATA FOR TRAY RATION HEATING SYSTEM COMPONENTS (MARINE CORPS ONLY)

Table 12. TRHS Equipment (MC Only).

QUADRUPLE CONTAINER (QUADCON)
TRAY RATION HEATING SYSTEM
- Heater Tank with Burner 1
- TRHS Power Cord 1
- Can, Fuel, Five-Gallon 1
- Holder, Fuel Can, Bracket Assembly 1
- Fuel Line/Filter with Quick Disconnect (12 1/2 –ft) 1
- Fuel Can Adapter Kit 1
- Inverter Assembly 1

COLLATERAL EQUIPMENT
- Padlock (for Quadcon) 2
- Tables, Folding, Stainless 3
- Bracket, Table, Rear 1
- Bracket, Table, Forward 1
- Clamp, Table 1
- Tiedown Straps, TRH 2
- Fire Extinguisher, 5-lb 1
- Bracket, Fire Extinguisher 1
- Tool Box, Portable 1
  - Screwdriver, Cross Tip (1/4-in) 1
  - Screwdriver, Flat Tip (1/4-in) 1
  - Key Set, Hexagonal (2 to 5 mm) 1
  - Pliers, Slip Joint, 8-in 1
  - Wrench, Adjustable, 8-in 1
  - Hammer, Blacksmith's, 3-lb 1
- Pan Carriers, Side-Loading 3
- Beverage Dispenser, 5-gallon 6
- Tiedown Straps, Pan Carriers and Beverage Dispensers 2
- Gloves, Thermal (pr) 2
- Technical Manual 1
- Utensil Box, Portable 1
  - Can Opener, Stainless Steel, Edlund S11, w/Knife 1
  - Table Adapter, Can Opener 2
  - Tin Snips 1
  - Thermometers, Pocket 2
  - Spoodle, 8-oz 2
  - Spoon, Perforated, 11-in 4
  - Spoodle, 4-oz 2
  - Spoon, Serving, 11-in 6
  - Spatula 2
  - Tongs, 9-in 2
  - Knife, Cooks 1
  - Wire Whip, French, 12-in 1
- Insulated Tray Pack Holders w/ Lids 24
- High Temperature Drain Hose, 4-ft 1
- Tray Pack Handling Tool 1
- #10 Can Handling Tool 1
- Exhaust Elbow 1
- Strap Adapter 1

EQUIPMENT DATA FOR TRAY RATION HEATING SYSTEM COMPONENTS (MARINE CORPS ONLY)

Table 13. Tray Ration Heater (TRH) (MC Only).

WEIGHT:	
TRH Empty	320 lbs (141 Kg)
TRH With Tray Rations and Water	560 lbs (193 Kg)
DIMENSIONS:	
Height	25.5 in (64.7 cm)
Length	53.0 in (134.6 cm)
Width	23.0 in (58.4 cm)
CAPACITY	
Water	30 gal
Tray Rations	24
FUEL CONSUMPTION:	
Rate of fuel consumption:	
Operating at maximum firing rate:	0.5 gal (1.89 l)/hr
TRHS continuous operation (5 gallon fuel tank)	10 hrs
FUEL REQUIREMENTS	JP-8, JP-5, DFA, Kerosene
ELECTRICAL REQUIREMENTS	120 VAC
ENVIRONMENTAL:	
Operating temperatures	–25 °F to +125 °F (–32°C to +52°C)

Table 14. TRH Inverter (MC Only).

ELECTRICAL CHARACTERISTICS:	
Output Power.	300 W
Output Voltage.	120 VAC, 60 Hz
Input Voltage	24 VDC
WEIGHT.	15.7 lbs

Table 15. TRHS Tool Kit (MC Only).

CONTENTS:	
Hex Wrench Set, Metric (2-5 mm)	1
Pliers, Slip Joint	1
Screwdriver, Cross Tip	1
Screwdriver, Flat Tip	1
Tool Box, Portable	1
Wrench, Adjustable	1

EQUIPMENT DATA FOR TRAY RATION HEATING SYSTEM COMPONENTS (MARINE CORPS ONLY)

Table 16. TRHS Maintenance Kit (MC Only).

CONTENTS:

Maintenance Kit Box and Assembly Tray	1
Technical Manual: TM 09211A-14&P/1	1
TRH Burner (spare)	1
Atomizing Chamber Assembly	1
Fuel Pump	1
TRH Burner Control Box	1
Diagnostic Test Box	1
Burner Test Power Cord	1
Photocell	1
Photocell Light Socket	1
Photocell Power Cord	1
Spare Igniter	1
Ignition Transformer	1
Assorted Gaskets and O-Rings Set	1
Fuel Pump Pressure Gauge with Extension	1
Fuel Pump Vacuum Gauge with Extension	1
Compressor Pressure Gauge	1
Nylon Pump Coupling	1
Compressor Air Filter	1
Small Tool Kit	1
10 mm Wrench (Open/Box)	1
11 mm Wrench (Open/Box)	1
5/8-Inch Wrench (Open/Box)	1
1/8-Inch Flat-Tip Screwdriver	1
3/16-Inch Flat-Tip Screwdriver	1
Hose Clamps, Cotter Pins and Clips	1
Fuel Filter	1

END OF WORK PACKAGE

OPERATOR AND FIELD MAINTENANCE

THEORY OF OPERATION

GENERAL (ARMY ONLY)

The Assault Kitchen is a food service system comprised of the Tray Ration Heater, Modern Burner Unit and supporting food service equipment.

The Assault Kitchen was developed to provide hot tray ration meals to personnel in remote locations. When installed on an M1101 or M1102 Cargo Trailer the Assault Kitchen can heat tray rations in transit to serve 250 tray ration meals in one location with a combined capability to serve 500 tray ration meals in one day. Upon arrival at the serving location, the Assault Kitchen can then be set-up and begin to serve meals.

Tray Ration Heater (TRH)

The Tray Ration Heater (TRH) consists of a stainless steel water tank and multi-fuel burner that operates from its own fuel source (5-gallon can). The TRH maintains water temperature between 180°F and 200°F for up to 10 hours and can heat 24 tray packs in approximately 1 hour. The TRH can draw electrical power from a HMMWV, using an inverter assembly, or can be plugged in to any 120 VAC, 60 Hz power source.

There are safety features on the TRH that prevent it from operating unless certain operating conditions are met. The low water sensor, located inside the water tank, will not allow proper burner function unless the water level is sufficient. The tilt switch, inside the electrical control box, will shut down the burner in the case of accidental tip over or excessive tilt. The thermal resistor, which is located next to the low water sensor; ensures proper water temperature between 180°F and 200°F for ration heating. A circuit breaker on the electrical control box resets power after an automatic safety shutdown.

The TRH Burner has three safety features as well. A photocell inside the burner housing ensures “proof of flame”, which will turn off the igniter once a flame is detected inside the burner tube. The photocell also acts as a monitor in the event the burner flames out; the photocell will allow the igniter to restart the burner. The burner also has a sump that is constantly monitored by an overflow safety device, which will shut off the inlet fuel solenoid until the fuel level recedes to the proper operating level. The TRH Burner control box also has a relay safety feature that disables the control box when an unsafe operating condition is detected.

Modern Burner Unit (MBU)

The Modern Burner Unit (MBU) is a small, lightweight heating unit that operates from its own fuel source (5-gallon can). The MBU can provide 15,000 to 52,000 BTUs for 4 to 20 hours depending on firing rate setting. Refer to TM 10-7310-281-13&P; Operator’s, Unit, and Direct Support Maintenance Manual, Including Repair Parts and Special Tools List (RPSTL) for Modern Burner Unit (MBU-V3) NSN 7310-01-507-9310 for Maintenance Procedures.

Food Service Components

The Assault Kitchen contains components for handling and serving of tray rations and beverages. When the Assault Kitchen arrives at a feeding location the folding tables are removed, unfolded and set up to establish a serving line for food service. Hot tray packs are removed from the TRH or insulated pan carriers, opened and served. As hot tray packs are removed from the TRH, they are replaced with new tray rations, which will then be ready to serve at the next feeding location. Upon completion of food service, tables and equipment are stored on the vehicle and secured for travel.

GENERAL (MARINE CORPS ONLY)

The Tray Ration Heating System is a food service system comprised of the Tray Ration Heater with TRH Burner and supporting food service equipment. Maintenance and Tool kits are supplied to maintain and service the TRHS.

TRH Burner Operation

The TRH Burner employs a unique fuel atomization technique to achieve high efficiency, reliable, smokeless operation. The atomization principle is shown in Figure 1. Fuel is supplied to the exterior surface of a hollow convex atomizer; fuel spreads out and covers the entire atomizing surface with a continuous thin film. The atomizer surface contains a small, laser-cut hole. As compressed air escapes through this small orifice, it ruptures the portion of the thin film that flows over the exterior surface of the atomizer. This creates a continual dispersion of liquid particles that are as much as 10 times smaller than those produced by a conventional burner. The portion of the fuel not turned into a fine mist by the escaping air drains into a sump where it is re-circulated back to the fuel supply system. This makes the TRH Burner insensitive to contamination, even if the fuel contains water, dirt, or other particulate matter.

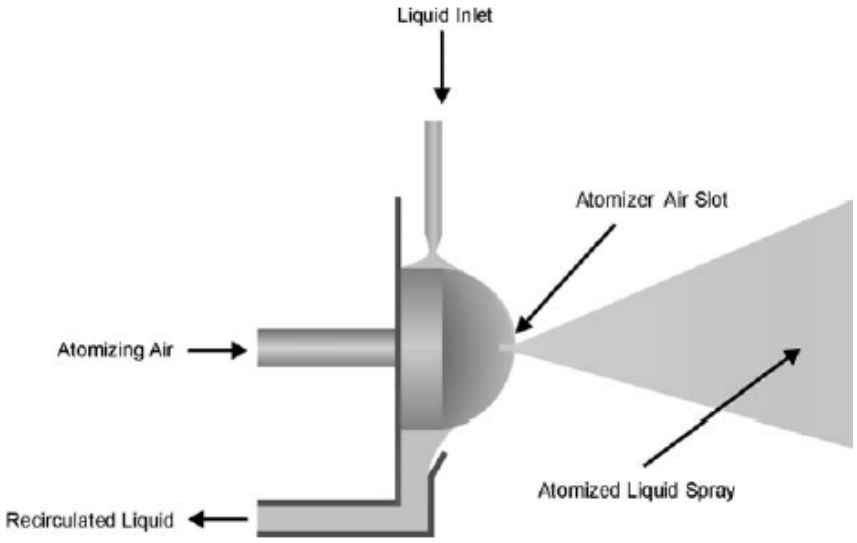


Figure 1. Atomization Principle.

The TRH Burner has two atomizers mounted in the atomizing chamber. The amount of fuel being converted into a mist is controlled by the Fuel Flow Control screw, this regulates the thickness of fuel covering the atomizers, the thicker the coating of fuel, the more mist is made. The two mist sprays converge in the flame tube to create a swirling flame with excellent combustion stability.

A blower fan that is controlled by the Combustion Air Control knob provides the combustion air. This air mixes with the fuel mist to provide the additional air required for complete burning of the fuel. It is important to maintain a proper balance of fuel mist and this combustion air for proper operation.

Ignition is achieved with a compact, low-energy, solid-state ignition transformer that is located inside the TRH Burner housing.

Safety devices are incorporated into the TRH Burner by use of a “Primary Control Box”. The control box uses information collected from an attached photocell to determine if the TRH Burner is performing properly. The control box controls startup and automatically stops the TRH Burner if any of the following cases occur; failure to start properly, flame failure while running, or problems with the control system on the TRH Burner.

GENERAL (MARINE CORPS ONLY) - CONTINUED

Tray Ration Heater Tank Safety Features

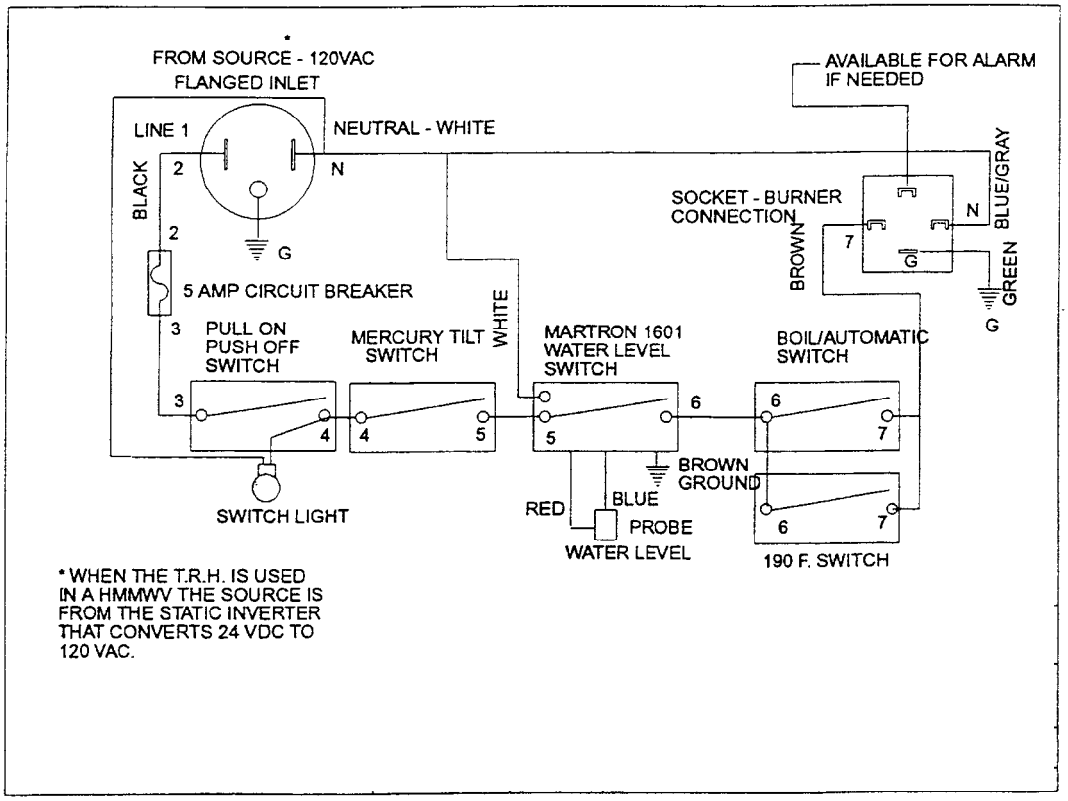


Figure 2. TRH Tank Electrical Control Box Schematic.

Both the TRH Tank and TRH Burner each have their own unique safety features. The components listed below break the power supply to the TRH Burner as shown schematically in Figure 2. These components must be functioning properly before the TRH Burner will ignite.

- Circuit breaker on the TRH Tank electrical control box.
- Tilt switch to shut down the TRH Burner in the case of accidental tip over or excessive tilt.
- Water level sensor to ensure TRH Burner will not fire without sufficient water in the TRH Tank.
- Thermal resistor to regulate water temperature.
- Red, Pull-ON/Push-OFF switch and AUTO/BOIL toggle switch.

When the TRH Tank safety features listed above are functional, the TRH Burner will operate under its own safety and control features, as listed below.

Photocell. The TRH Burner photocell must “see” dark prior to light-off. This ensures it is properly installed in the TRH Tank, without “light leakage”. During startup, the TRH Burner photocell must “see” light to establish “proof of flame” within ten seconds or the TRH Burner will go into “lockout”. After “proof of flame” is established, the ignition spark will turn off. This increases igniter and ignition transformer life. TRH Burner constantly monitors flame to confirm “proof of flame”. In the event the TRH Burner flames out for any reason, it will automatically relight within ten seconds. If “proof of flame” is not re-established after ten seconds during re-light trial, the TRH Burner control goes into “lockout”.

GENERAL (MARINE CORPS ONLY) - CONTINUED

Overflow Safety Float Switch. The fuel level in the TRH Burner sump is constantly monitored; if the level rises too high for any reason, the overflow safety float will shut off the inlet fuel solenoid until the fuel level recedes to proper operating level.

TRH Burner Control Box. Should the TRH Burner go into “lockout” it must be manually reset by pushing the button on the back of the TRH Burner control box. This button has a red light indicator for “lockout”. After a two-minute wait, reset the TRH Burner control box by depressing the button and the red light will go out.

END OF WORK PACKAGE

CHAPTER 2

OPERATOR INSTRUCTIONS
FOR
ASSAULT KITCHEN

OPERATOR MAINTENANCE

DESCRIPTION AND USE OF OPERATOR CONTROLS AND INDICATORS

INTRODUCTION

This work package provides the descriptions and location of the Assault Kitchen (AK) controls and indicators. Personnel operating and maintaining the AK should know the location and proper use of every control and indicator. The following illustrations show the locations of the controls and indicators on the AK as well as providing references for associated equipment.

DESCRIPTION AND USE OF OPERATOR CONTROLS AND INDICATORS

Figure 1. Tray Ration Heater Electrical Control Box (Driver Side).

Table 1. Tray Ration Heater Electrical Control Box (Driver Side).

Key	Item	Function
1	Circuit Breaker	Circuit breaker protects TRH from damage caused by an overload or short circuit.
2	Power Receptacle	Connects TRH to Power Inverter.

DESCRIPTION AND USE OF OPERATOR CONTROLS AND INDICATORS - CONTINUED

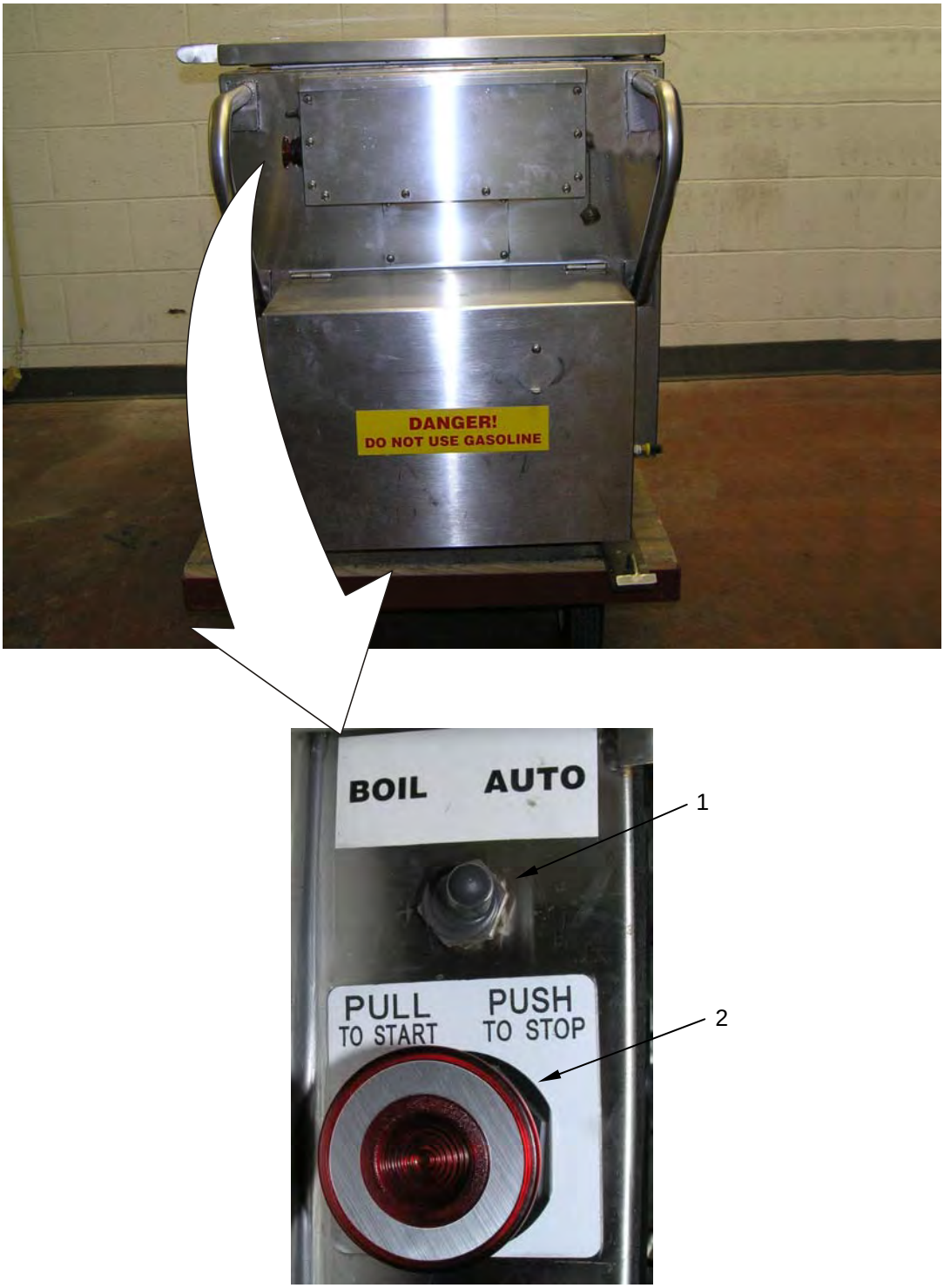


Figure 2. Tray Ration Heater Electrical Control Box (Passenger Side).

Table 2. Tray Ration Heater Electrical Control Box (Passenger Side).

Key	Item	Function
1	Auto/Boil Toggle Switch	Selects TRH operation mode.
2	Pull-On/Push-Off Switch	Controls power to TRH.

DESCRIPTION AND USE OF OPERATOR CONTROLS AND INDICATORS - CONTINUED

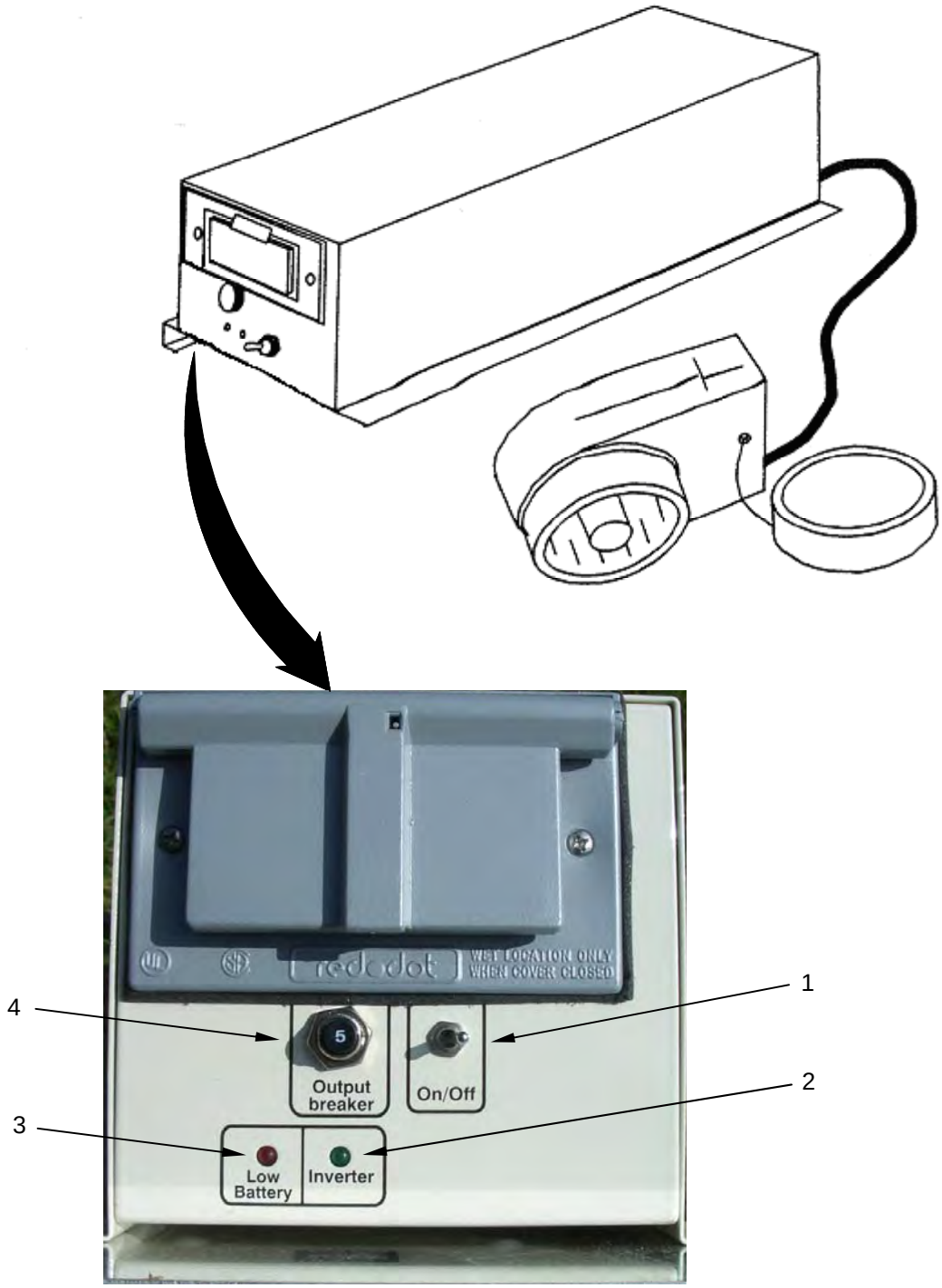


Figure 3. Inverter Assembly.

Table 3. Inverter Assembly.

Key	Item	Function
1	Power Switch	Controls power flow to TRH.
2	Green LED	Indicates proper power flow from NATO slave receptacle.
3	Red LED	Indicates that vehicle battery is low.
4	Circuit Breaker	Restores power to inverter after overload.

DESCRIPTION AND USE OF OPERATOR CONTROLS AND INDICATORS - CONTINUED

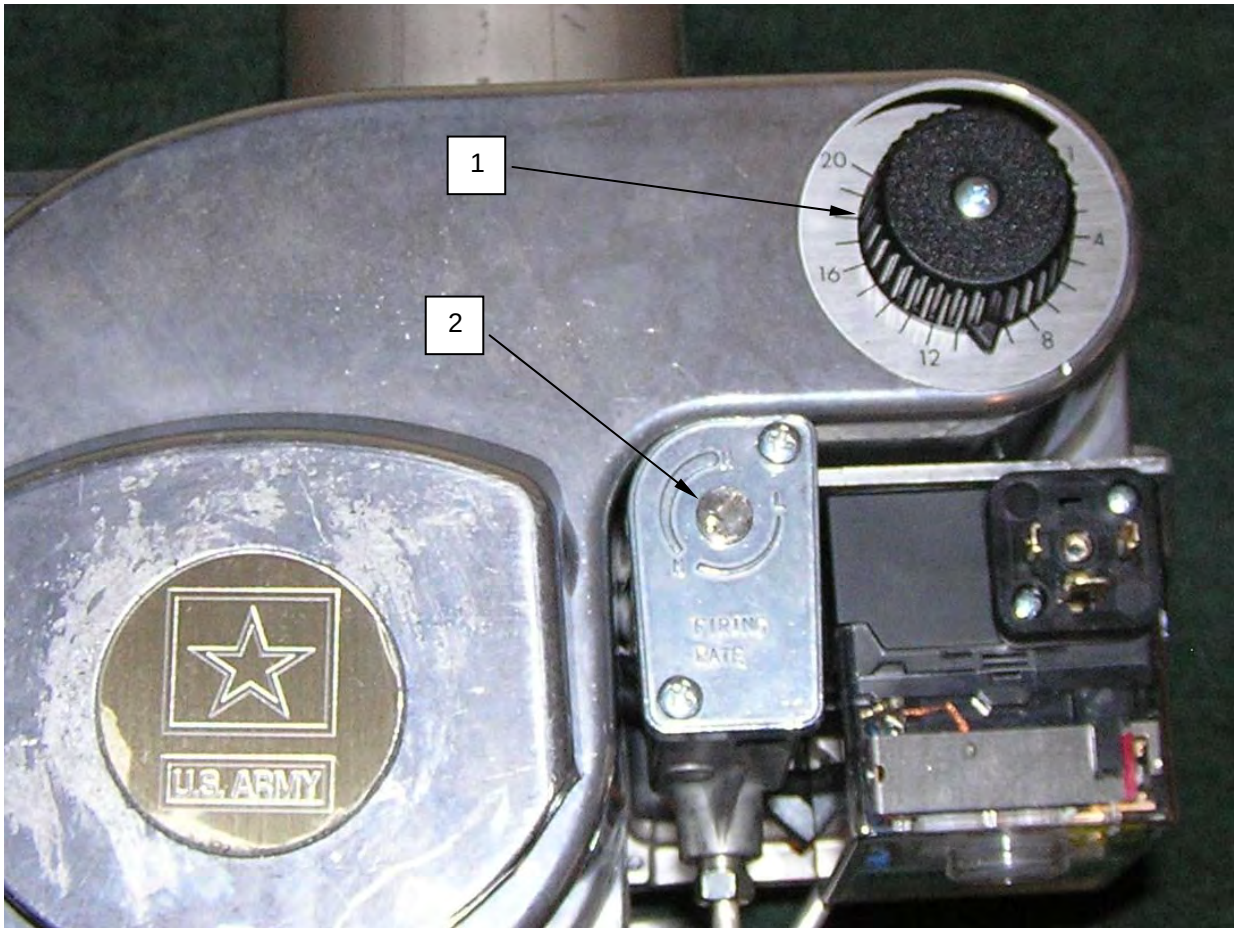


Figure 4. TRH Burner Assembly.

Table 4. TRH Burner Assembly.

Key	Item	Function
1	Combustion Air Control	Controls Burner Air Flow (Should be set to “10”).
2	Fuel Flow Control	Controls Burner Fuel Flow (Should be set to “M”).

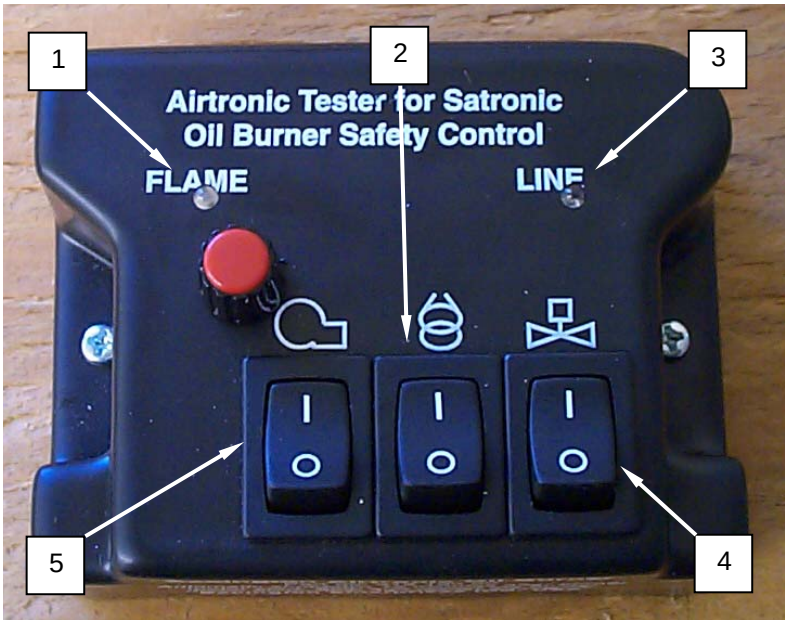
DESCRIPTION AND USE OF OPERATOR CONTROLS AND INDICATORS - CONTINUED

Figure 5. TRH Burner Control Box.

Table 5. TRH Burner Control Box.

Key	Item	Function
1	TRH Control Box Reset	Resets the TRH Control Box after lockout.

DESCRIPTION AND USE OF OPERATOR CONTROLS AND INDICATORS - CONTINUED



I = ON

O = OFF

Figure 6. Burner Test Box.

Table 6. Burner Test Box.

Key	Item	Function
1	Red Flame LED	Indicates flame is present.
2	Ignition test switch	Controls ignition spark.
3	Amber Line LED	Indicates power to burner test box.
4	Air Solenoid test switch	Controls air solenoid.
5	Blower Motor test switch	Controls blower motor.

DESCRIPTION AND USE OF OPERATOR CONTROLS AND INDICATORS - CONTINUED

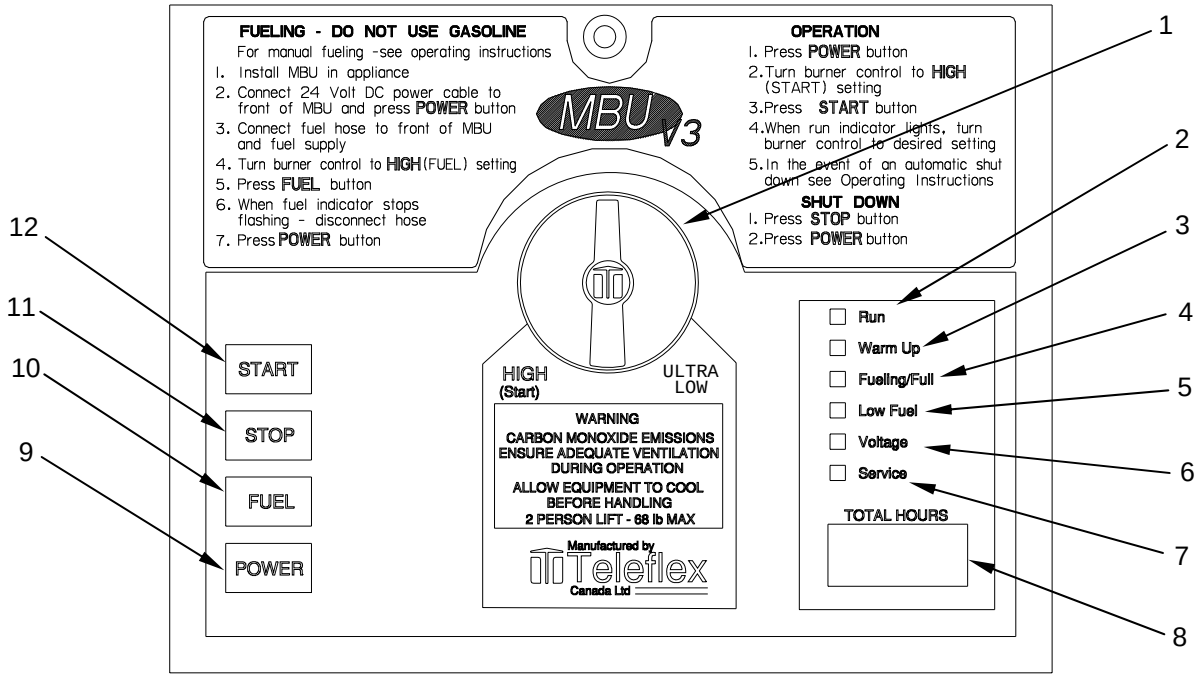


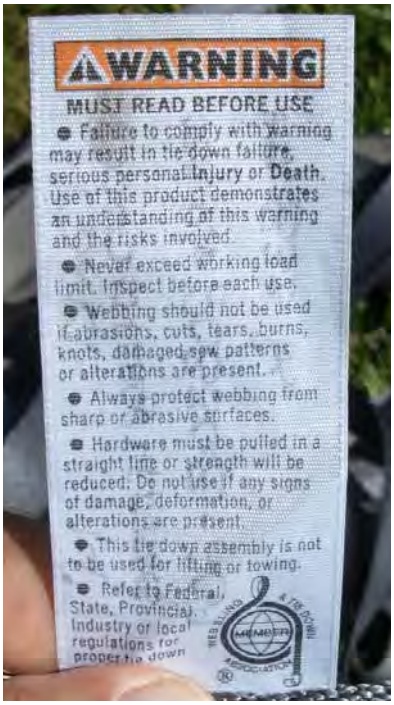
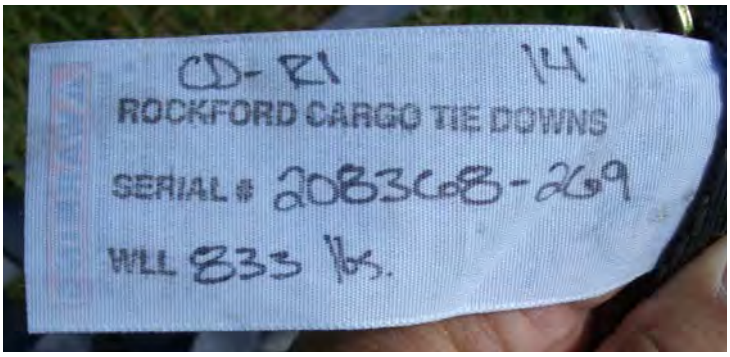
Figure 7. MBU V-3 Controls and Indicators (Army Only).

Table 7. MBU V-3 Controls and Indicators (Army Only).

Key	Item	Function
1	Firing Rate Adjustment	Adjusts burner firing rate.
2	Run	Indicates burner is operating.
3	Warm Up	Indicates burner is warming up.
4	Fueling/Fuel	Indicates tank is filling (during fueling) or full.
5	Low Fuel	Indicates low fuel shut-down sequence active.
6	Voltage	Indicates incorrect voltage.
7	Service	Indicates mechanical malfunction.
8	TOTAL HOURS	Shows accumulated hours of operation. Background light indicates power-on condition.
9	POWER	Main power on/off button.
10	FUEL	Starts fueling function.
11	STOP	Burner shut-down.
12	START	Burner start-up.

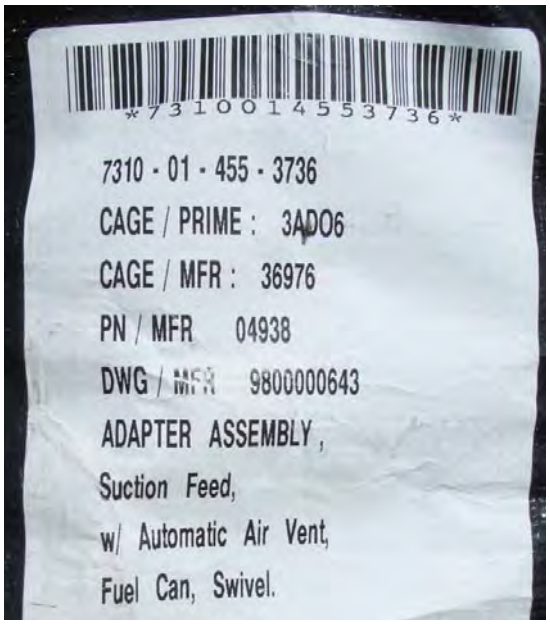
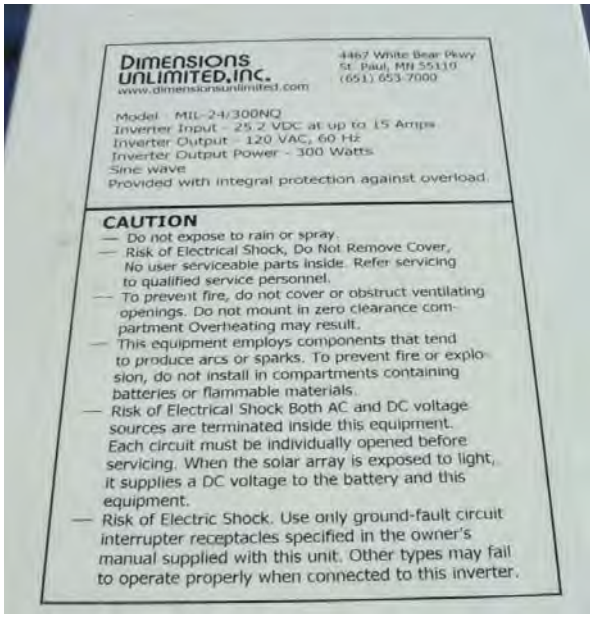
LABELS AND DATA PLATES

Table 8. Decals and Instruction Plates.

Decal	Description and Location
	Warning label on tag attached to 14 ft. cargo strap (USMC Only).
	Data on the reverse side of tag attached to 14 ft. cargo strap (USMC Only).
	Warning label on the TRH water tank.

LABELS AND DATA PLATES - CONTINUED

Table 8. Decals and Instruction Plates - Continued.

Decal	Description and Location
	Data on the 5,000 lb cargo strap (Army Only).
	Data tag on the fuel can adapter bag.
	Data plate on the power inverter.

LABELS AND DATA PLATES - CONTINUED

Table 8. Decals and Instruction Plates - Continued.

Decal	Description and Location
	Warning label on the base of the burner compartment.
	Warning label on the side of the water tank, under lid opening.
	Warning label on the exhaust end of the TRH tank, underneath TRH carrying handle (Army Only).
	Warning label below lid latch on side of TRH tank, below tank lid (Army Only).

LABELS AND DATA PLATES - CONTINUED

Table 8. Decals and Instruction Plates - Continued.

Decal	Description and Location
	Warning label on the TRH tank lid (Army Only).
	Warning label below pressure release port on side of TRH tank, below tank lid (Army Only).
	Warning label below lid latch on side of TRH tank, below tank lid (Army Only).

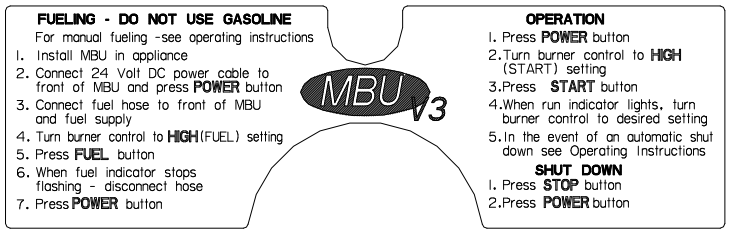
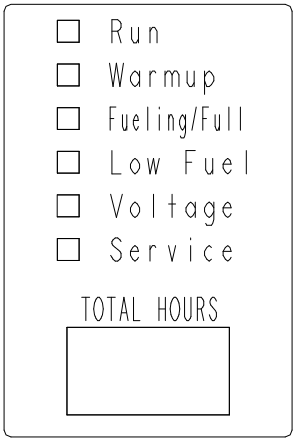
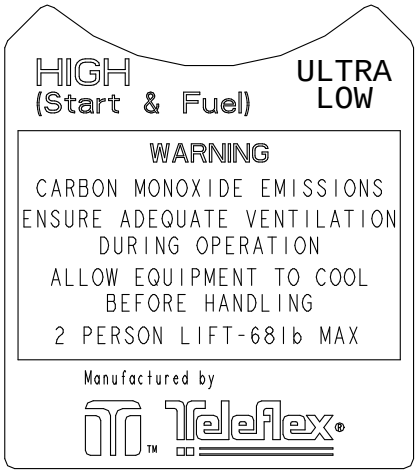
LABELS AND DATA PLATES – CONTINUED

Table 8. Decals and Instruction Plates - Continued.

Decal	Description and Location
	Data plate on lower front right body of TRH Tank (Army Only).
	Data plate on lower front right body of TRH Tank (USMC Only).
	Stockpot cradle warning label (Army Only).

LABELS AND DATA PLATES - CONTINUED

Table 8. Decals and Instruction Plates - Continued.

Decal	Description and Location
	MBU Control Panel Set Up, Operation, and Shut Down Label (Army Only).
	MBU Control Panel Indicator Label (Army Only).
	MBU Burner Control Valve Label (Army Only).

END OF WORK PACKAGE

OPERATOR MAINTENANCE

OPERATION UNDER USUAL CONDITIONS

INITIAL SETUP:

Tools and Special Tools

Maintenance Kit (WP 0066, Item 1)
Tool Kit (WP 0066, Item 3)

Materials/Parts

Contaminated Waste Plastic Bag
(WP 0065, Item 2)

Equipment Condition

All equipment shall be serviceable and ready for use.

Personnel Required

Food Service Specialist 92G (2)
Food Service Technician 3381 (2)

References

WP 0008
WP 0013
WP 0014
MCRP 4-11.8A
FM 10-23

GENERAL

This WP covers service specific planning, setup, operation, and tear down of AK field feeding operations.

OPERATING PROCEDURES FOR ASSAULT KITCHEN (ARMY ONLY)

Mission Preparation

Before preparing the AK for service, determine the requirements of the mission. Mission requirements will dictate the number of tray packs, no. 10 cans, and beverages that will need to be taken with the system.

Prepare the AK at a secure support location by completing the following tasks before heading to the feeding site:

1. Ensure fuel cans are full and check to ensure fuel line connections from fuel can to TRH are secure.
2. Prepare initial batch of rations by loading TRH with tray packs and water so that the water level is approximately 1 1/2" below the top of the tray packs. Initial batch of rations may take up to 60 minutes to heat to serving temperature.
3. Prepare warming beverages in available kitchen support equipment. Store beverages in insulated beverage dispensers when completed. Secure beverage dispensers in AK.
4. Mix cold beverages and store in insulated beverage dispensers when completed. Secure beverage dispensers in AK.
5. Fill water cans, extra fuel cans, and ice storage chest with enough supplies for the proposed mission.
6. Remove hot tray packs from the TRH and store in the side loading pan carrier that will be the easiest to access upon feeding site arrival.
7. Load TRH with new batch of tray packs before departing.

END OF TASK

OPERATING PROCEDURES FOR ASSAULT KITCHEN (ARMY ONLY) - CONTINUED

Deployment Cycle

NOTE

To aid in removal of components it may be desirable to park the vehicle and trailer so that both form an angle allowing access to equipment without the need to unhitch trailer. Deploy Assault Kitchen components in the following order:

Upon arrival at the feeding site, the following procedures should be used to set up a serving line.

Foul Weather Canvas (Optional)

The foul weather canvas is an additional authorized item for the AK. To protect service personnel from inclement weather conditions, the rain cover may be deployed as follows:

1. Remove Foul Weather Canvas (Figure 1, Item 1) from trailer and unpack components.

2. Unfold the canvas and lay it on the ground (Figure 1, Item 2).

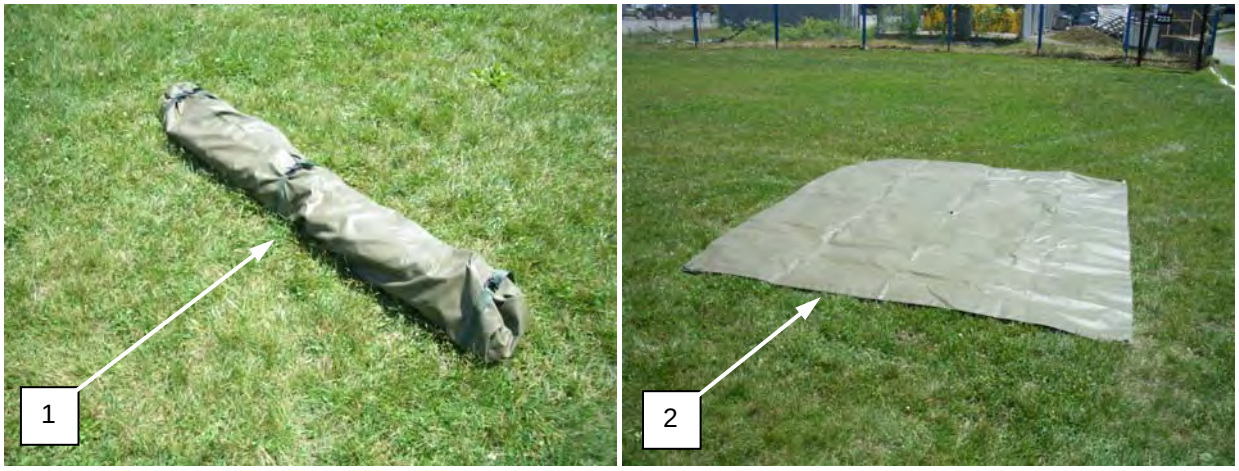


Figure 1. Foul Weather Canvas (Army Only).

3. Extend tent poles to approximately 7 ft.

OPERATING PROCEDURES FOR ASSAULT KITCHEN (ARMY ONLY) – CONTINUED

4. Lay extended tent poles (Figure 2, Item 1) at a 45° angle from the four corners of the canvas (Figure 2, Item 2).

5. Hammer tent pins (Figure 2, Item 3) into the ground a few inches from tent pole ends, angled away from the canvas.

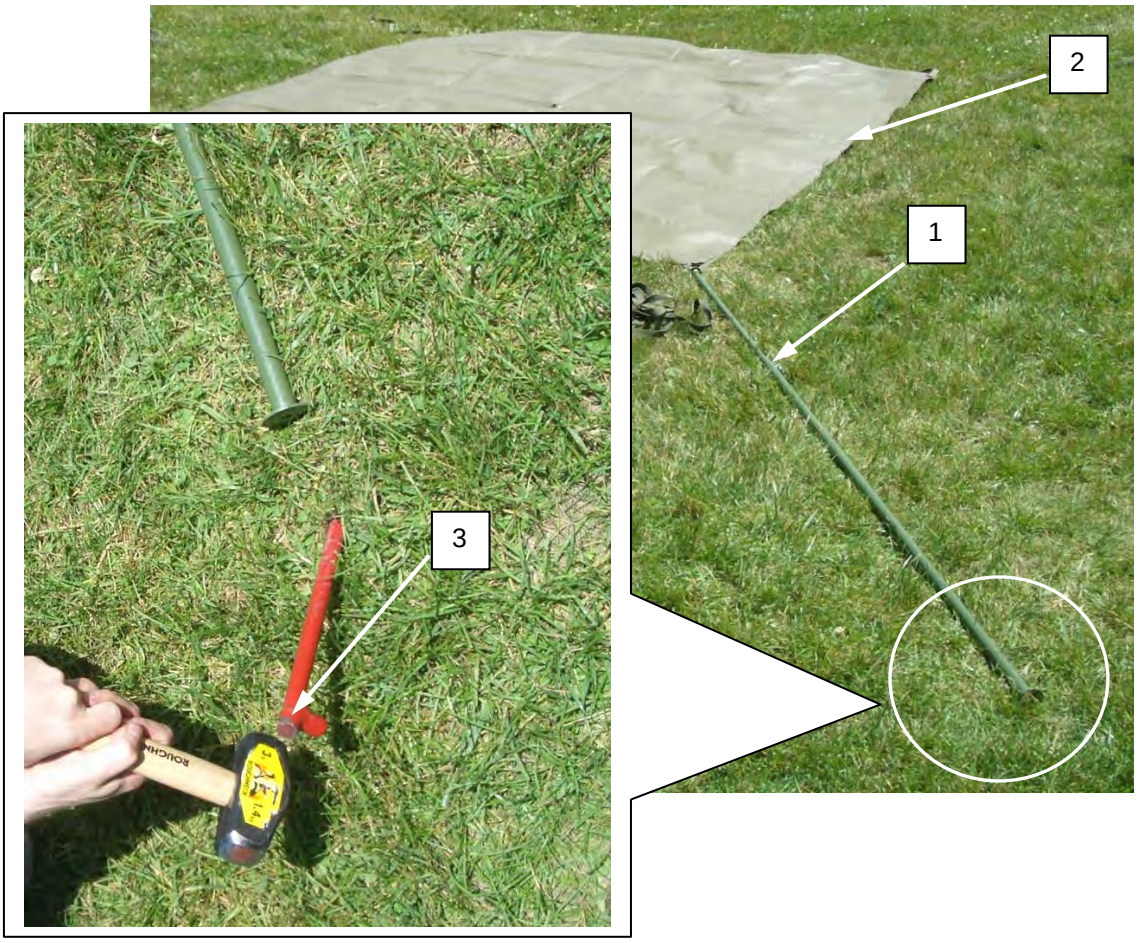


Figure 2. Setting Up Foul Weather Canvas (Army Only).

OPERATING PROCEDURES FOR ASSAULT KITCHEN (ARMY ONLY) - CONTINUED

6. Insert end of tent poles into corner grommets of canvas.
7. Place stay ring over top of tent pole protruding through grommet in corner of canvas.
8. Loop opposite end (free end) of stay loop over tent stakes.
9. Stand up each tent pole and tighten stays.
10. Insert center tent pole in hole at center of rain cover so that center tent pole is at a higher height level than outer tent poles (Figure 3, Item 1).

Figure 3. Foul Weather Canvas Placement (Army Only).

END OF TASK

Folding Tables

1. Remove tables from trailer, unfold legs, and lock into place (Figure 4, Item 1).
2. Adjust folding tables to proper serving height (Figure 4, Item 2) by pressing in leg button (Figure 4, Item 3) while sliding table leg to desired height.
3. Set up the folding tables in desired feeding configuration (Figure 4, Item 2).

Figure 4. Folding Table Set Up and Placement (Army Only).

END OF TASK

OPERATING PROCEDURES FOR ASSAULT KITCHEN (ARMY ONLY) - CONTINUED

Insulated Food Carriers (IFCs)

1. Loosen straps to remove the IFCs necessary for feeding (Figure 5, Item 1).
2. Place IFCs on folding tables for feeding (Figure 5, Item 2).
3. Load IFCs with hot rations from TRH or side loading pan carrier.

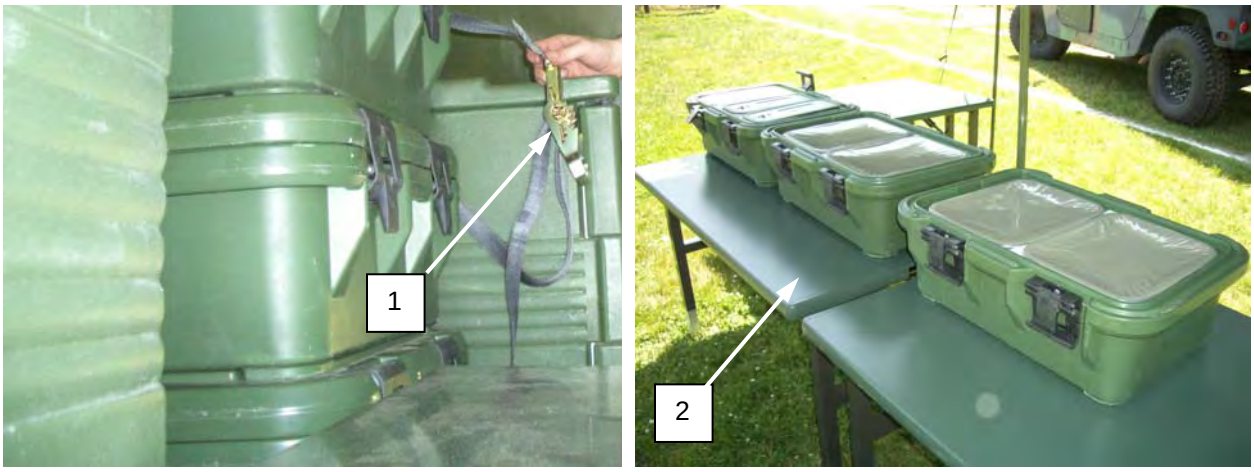


Figure 5. IFC Placement (Army Only).

END OF TASK

OPERATING PROCEDURES FOR ASSAULT KITCHEN (ARMY ONLY) - CONTINUED

Can Opener

1. If necessary, attach can opener base (Figure 6, Item 1) to folding table.
2. Slide can opener rail (Figure 6, Item 2) into can opener base (Figure 6, Item 1).

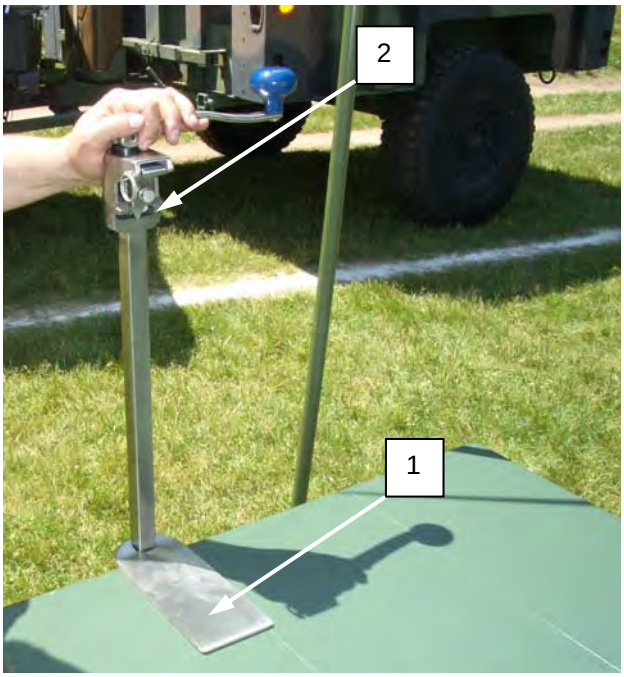


Figure 6. Can Opener Base and Rail Placement (Army Only).

END OF TASK

OPERATING PROCEDURES FOR ASSAULT KITCHEN (ARMY ONLY) - CONTINUED

Insulated Beverage Dispenser (IBD)

1. Loosen straps or elastic cords from IBDs so that they can be removed from vehicle.
2. Remove IBDs necessary for serving and set up on end of serving table (Figure 7, Item 1).

Figure 7. Can Opener and Beverage Dispensers Placement (Army Only).

END OF TASK

Serving Utensil Kit

1. Remove serving utensil kit from HMMWV and place near serving line.
2. Remove necessary utensils from utensil kit.

END OF TASK

OPERATING PROCEDURES FOR ASSAULT KITCHEN (ARMY ONLY) – CONTINUED

Stockpot Assembly with Modern Burner Unit (MBU)

NOTE

Stockpot cradle and MBU are only used if necessary.

It may be necessary to loosen the cable tie connecting NATO power cable to tailgate to provide enough cable slack to lower tailgate.

1. Lower tailgate, if necessary, to facilitate removal of stockpot cradle assembly components.
2. Loosen cargo strap to remove stockpot cradle assembly components (Figure 8, Item 1).

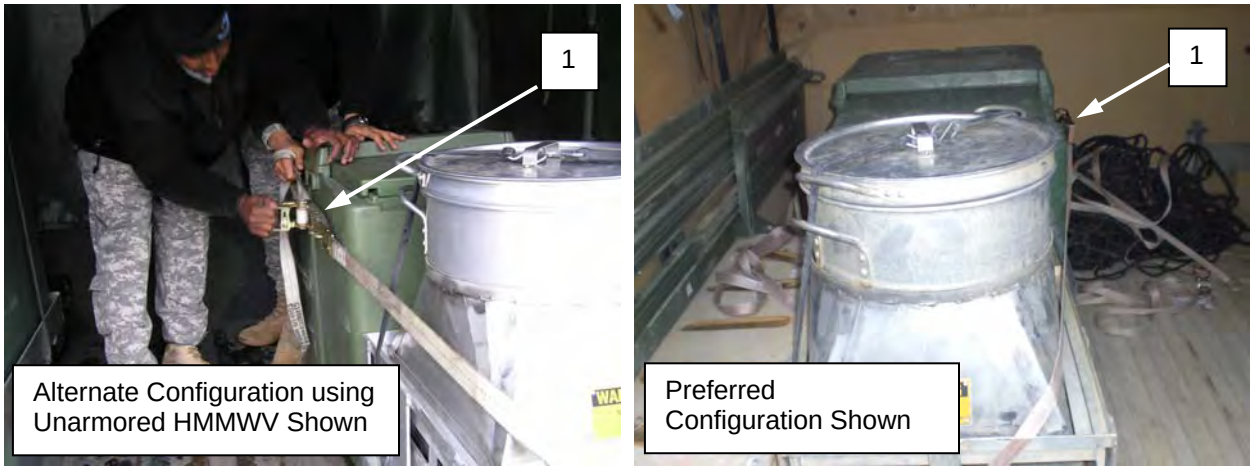


Figure 8. Stockpot Cradle Removal (Army Only).

3. Remove stockpots from stockpot cradle and remove cradle from base and burner rack.

OPERATING PROCEDURES FOR ASSAULT KITCHEN (ARMY ONLY) – CONTINUED

WARNING

Operate the MBU at least 10 feet away from vehicles. Failure to observe this warning may result in injury or death.

4. Remove base rack (Figure 9, Item 1) and place at least 10 feet from vehicle.
5. Remove MBU (Figure 9, Item 4) from burner rack (Figure 9, Item 2) and set aside.
6. Remove MBU burner rack and place on top of base rack.
7. Place MBU (figure 9, Item 4) in burner rack with the controls facing out.
8. Place stockpot cradle (Figure 9, Item 3) on top of burner rack.
9. Place 10 or 15 gal. stockpot in stockpot cradle (Figure 9, Item 5).
10. Refer to TM 10-7310-281-13&P for connection and operation of MBU.

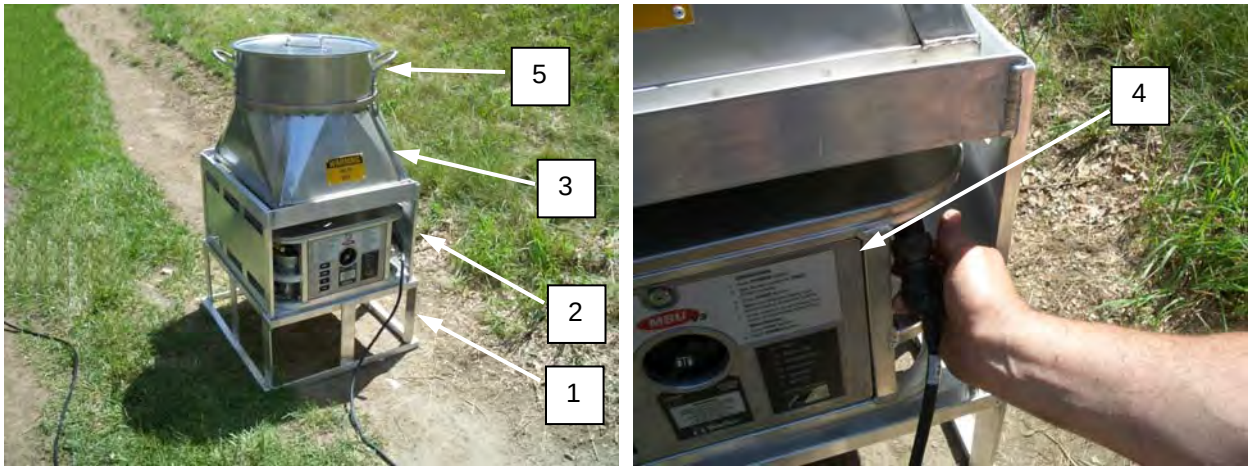


Figure 9. Stockpot Cradle Placement (Army Only).

END OF TASK

Ration Serving

Remove hot tray rations from SLPC or TRH and place in IFCs set-up on serving line. Open tray packs and/or no. 10 cans and place appropriate serving utensil with each tray.

END OF TASK

OPERATING PROCEDURES FOR ASSAULT KITCHEN (ARMY ONLY) – CONTINUED

Equipment Breakdown and Stowage

WARNING

Food waste and food preparation components should never be kept in the same area. Never use the AK to transport discarded tray rations. Failure to observe warnings may lead to bacterial contamination of food service equipment resulting in severe illness or even death.

NOTE

Due to different configurations of the AK, stowage of individual components in the HMWWV and LTT will vary. Refer to WP 0013 through WP 0016 for configurations and appropriate methods of securing equipment for travel.

1. Discard open tray packs and disposable mess gear. Do not use the AK to transport or store waste.
2. Clean serving utensils IAW WP 0008. Repack serving utensils in utensil box and replace in vehicle. Secure with elastic cord IAW WP 0013.
3. Clean tables IAW WP 0008.
4. Replace IFCs and beverage dispensers in vehicle and secure with cargo straps IAW WP 0013.
5. Replace tables in vehicle IAW WP 0013.
6. Repack any remaining unopened tray packs and replace in vehicle IAW WP 0013.
7. Disconnect MBU, if used, and replace in vehicle IAW WP 0013.

END OF TASK

OPERATING PROCEDURES (MARINE CORPS ONLY)

TRHS Maximum Single Site Procedure

The TRHS is capable of providing 500 meals to three or more sites within a ration day. The TRH fuel capacity is sufficient for at least 10 hours of continuous heater operation. The contents of 16 unitized tray ration modules can be loaded into the HMMWV at the beginning of the ration day and will require subsequent replenishment.

Operators must follow the pre-heating procedures listed in the TRHS Maximum Single Site Procedure paragraph so that hot meals are ready to serve at each site. At each site, operators must set up serving line, clean up tables and utensils (using hot soapy water) and stow TRHS equipment in the HMMWV for movement to a subsequent site.

The TRHS can be used to feed 250 hot meals at one site in 90 minutes. This time period is adequate to set-up, serve and clean up.

1. Heat first load of tray packs in preparation for the mission. Allow approximately 40 minutes for this activity. Place preheated tray packs in the insulated, side-loading pan carriers.

2. Place cold tray packs in the TRH tank and proceed to the feeding site. Allow about 40 minutes for these tray packs to heat before serving.

3. After arrival at the feeding site, set up the serving line. Comply with the following serving procedures:

    a. First, serve hot tray packs brought to the site in the TRH tank.

    b. Second, place remaining cold tray packs in the TRH tank and serve the preheated tray packs in the side-loading pan carriers.

    c. Third, serve the remaining tray packs contained in the TRH tank.

END OF TASK

Set-Up Serving Line

1. Establish whether the meals will be cooked in or out of the HMMWV. If the meals are cooked while the TRH is in the back of the HMMWV, do not load with water until the TRH is mounted in the HMMWV.

2. Load TRH with tray packs and/or #10 cans (remove tray pack rack, if necessary) issued for feeding.

3. To initiate operation, fill TRH with water such that 1 1/2 inches of tray packs are exposed or water level is approximately 2 inches from the top.

4. Close TRH lid and secure latches.

5. Ensure AUTO/BOIL switch on TRH electrical control box is in the AUTO position.

6. Ensure inverter switch is turned ON.

7. If necessary, check that the vent on the fuel can adapter is open.

8. Pull the red, pull-on/push-off switch to the ON position.

OPERATING PROCEDURES (MARINE CORPS ONLY) – CONTINUED

9. Observe the TRH for 5 minutes to ensure burner is functioning properly.

10. Allow tray packs to heat to 180°F for a minimum of 40 minutes before removing to serve or place into side-loading pan carriers.

11. Set up a serving line as follows:

    a. Set up tables by lifting the table clamp, removing tables from the HMMWV and assembling as shown in Figure 10.

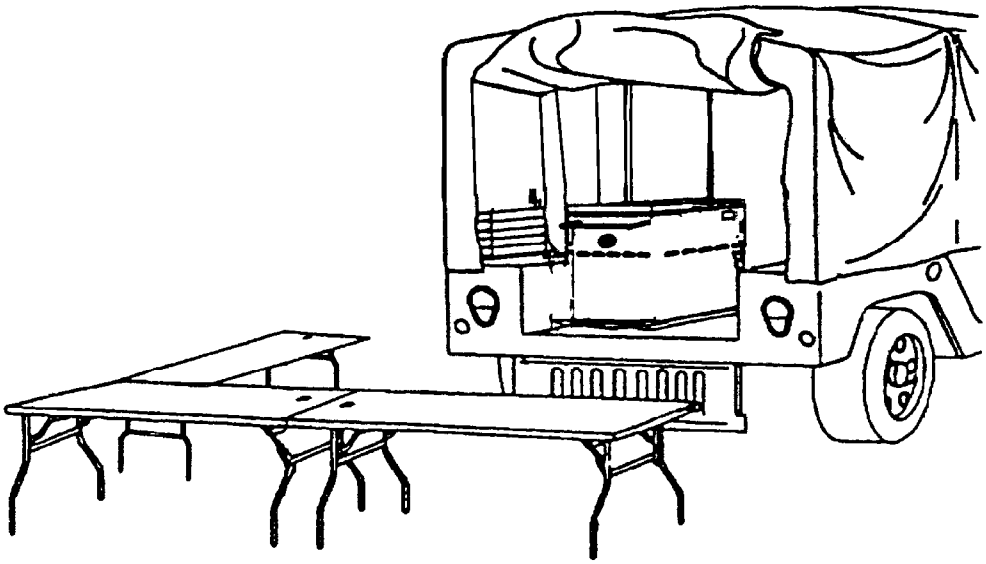


Figure 10. Proper Set-up of Serving Line (Marine Corps Only).

    b. Install the stainless steel can opener in a mounting bushing, which must be placed in the opening on a table end (the shank on the stainless can opener is smaller than the shank on the regular can opener, for which the hole in the table is sized). Place the following items on the tables: disposable mess gear, beverage containers, and supplements.

12. Remove tray packs from TRH tank first (replace with cold tray packs and close tank lid), then load side-loading pan carriers. Open tray packs and place on the serving line.

END OF TASK

OPERATING PROCEDURES (MARINE CORPS ONLY) - CONTINUED

TRHS Operations in Static Environment

In today's Marine combat environment, with the shortage of vehicle assets, there comes a time when the Tray Ration Heater System (TRHS) can not be mounted in a vehicle full time in support of feeding Marines. Having the TRHS (Figure 11) mounted in a vehicle is the ideal and intended use for this piece of equipment, but it can be used in a static environment. The TRHS can be taken out of the vehicle and powered at any 110V power outlet, or a vehicle with a NATO slave plug outlet can be pulled in close to the system and the inverter assembly (Figure 12) plugged into the vehicles NATO plug outlet. This gives the commander in the field the asset of hot chow without full time utilization of a vehicle.

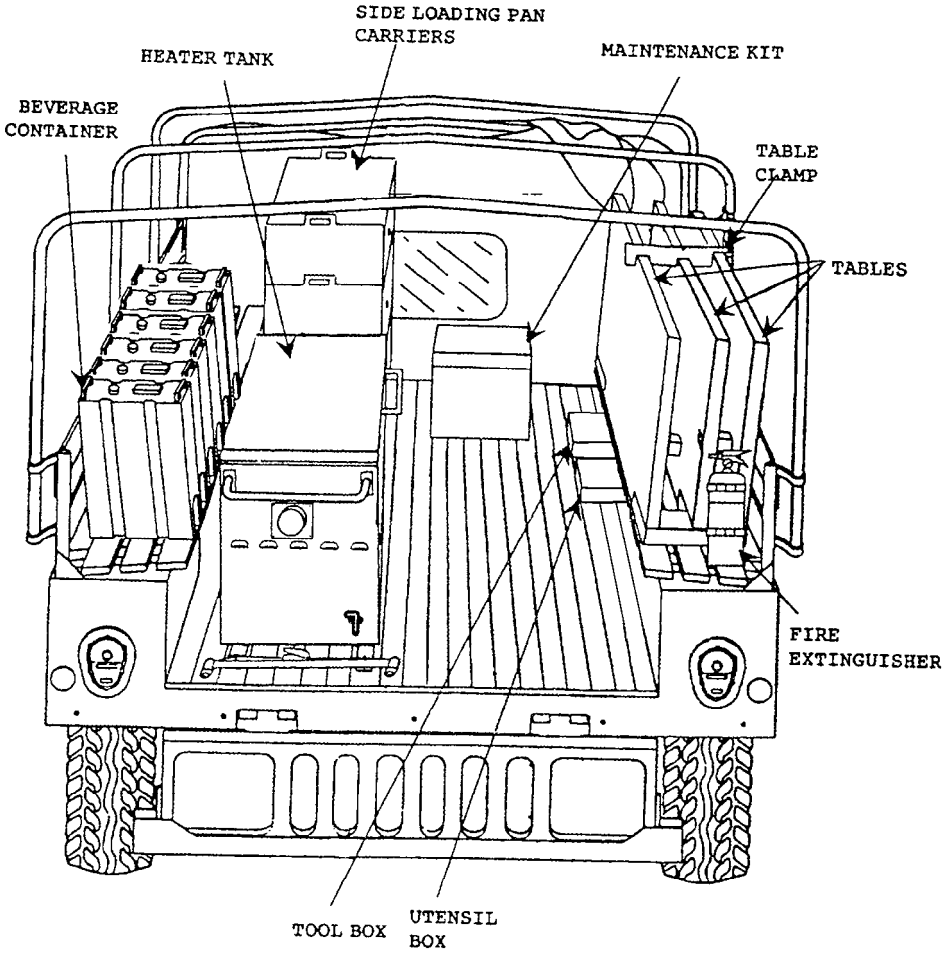


Figure 11. TRHS Layout (Sheet 1 of 2) (Marine Corps Only).

OPERATING PROCEDURES (MARINE CORPS ONLY) – CONTINUED

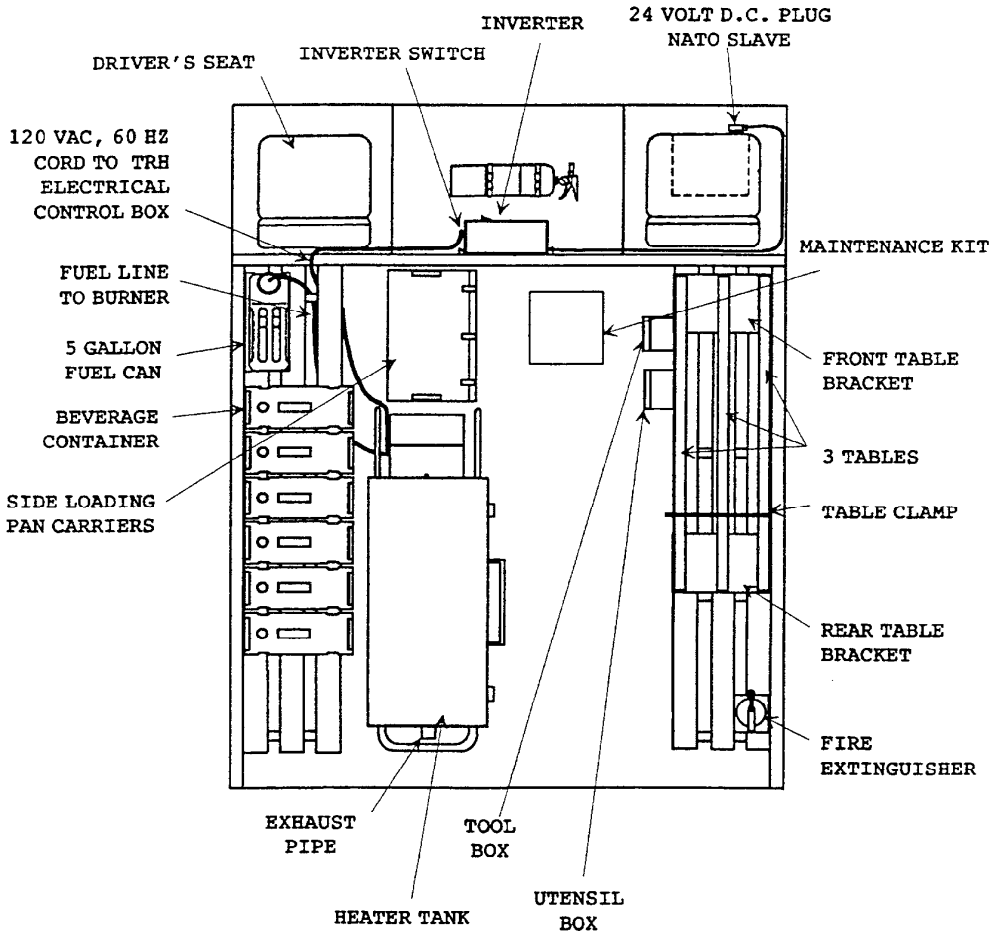


Figure 11. TRHS Layout (Sheet 2 of 2) (Marine Corps Only).

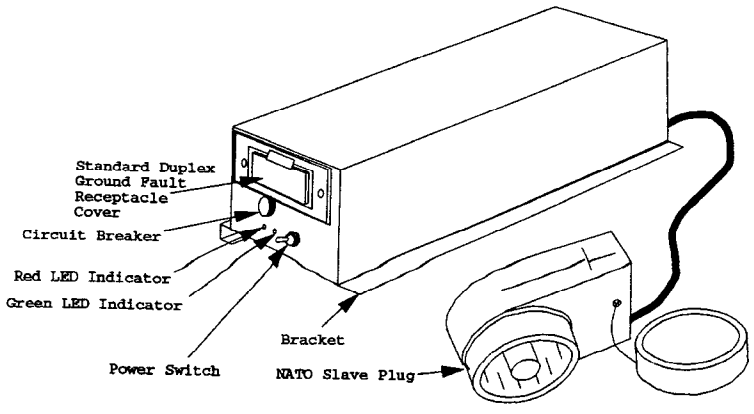


Figure 12. TRH Power Inverter (Marine Corps Only).

OPERATING PROCEDURES (MARINE CORPS ONLY) – CONTINUED

1. Unload the rain shelter from the vehicle

2. Set up the shelter (Figure 13) in a safe area, 300 feet away from any latrine facilities and 90 feet away from trash dumpsters, MCRP 4-11.8A.

NOTE

Consult the Preventive Medicine Medical personnel if there are any questions about siting procedures.

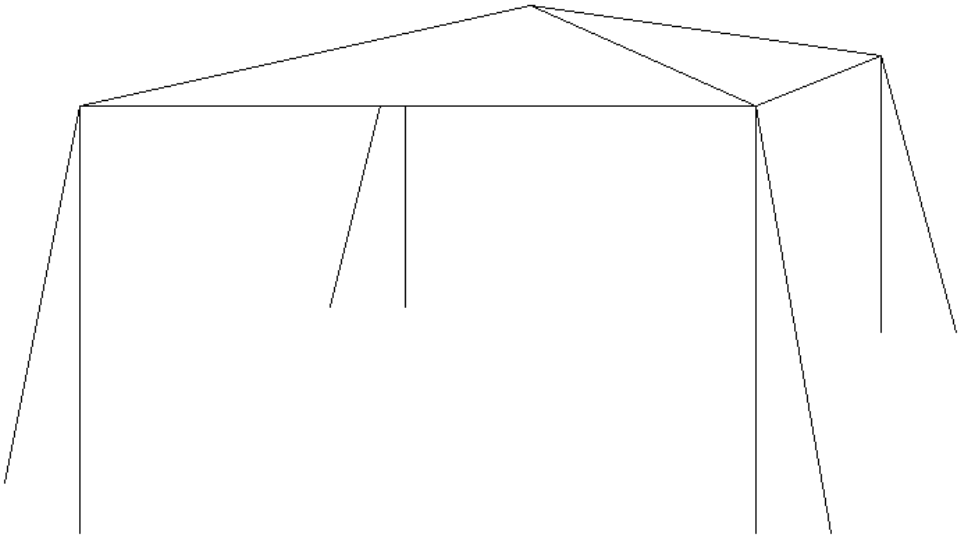


Figure 13. Setting Up The Shelter (Marine Corps Only).

OPERATING PROCEDURES (MARINE CORPS ONLY) – CONTINUED

3. The rain shelter is furnished with the system (Figure 13), but the use of a hasty shelter (Figure 14), general purpose medium tent (Figure 17, Item 1), or a hard facility (Figure 17, Item 2) can also be used.

NOTE

The general purpose medium tent or the hard facility provides protection from the elements, and a place to store rations.

Figure 14. TRHS Equipment Under Hasty Shelter (Marine Corps Only).

4. Unload the remainder of the equipment from the vehicle (Figure 15).

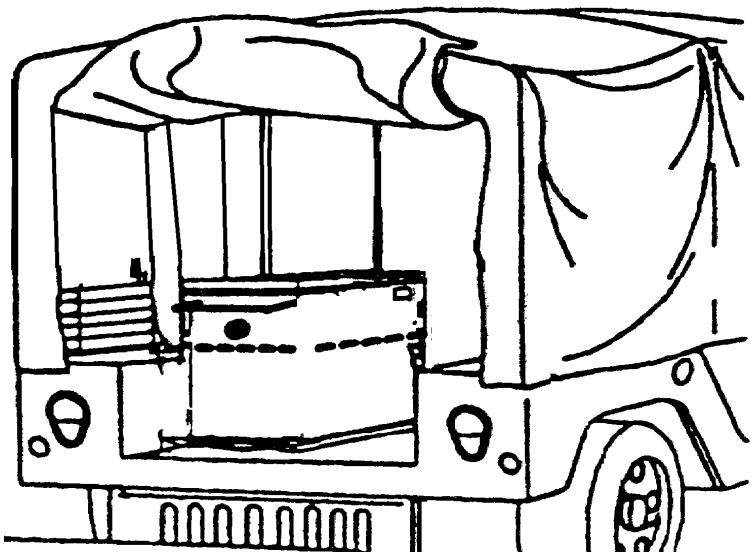


Figure 15. Unloading TRHS (Marine Corps Only).

OPERATING PROCEDURES (MARINE CORPS ONLY) – CONTINUED

5. Place the equipment under the shelter (Figure 16) or in the facility (Figure 17, Item 2). Place the Tray Ration Heater System so that it is accessible to an area that a vehicle can be pulled close enough to the shelter to provide power via the NATO slave plug or near an electrical outlet in a hard facility (Figure 17, Item 2).

WARNING

The TRH gives off heat when in operation. During operation, personnel shall exercise caution to prevent heat induced illnesses such as heat stroke and heat exhaustion. Keep area of operation ventilated and away from direct sunlight as much as possible. Refer to FM 4-25.11 for first aid treatment of heat induced illnesses Failure to observe warnings may result in injury or death to personnel.

WARNING

During operation, the TRH produces harmful carbon monoxide (CO) and other gases. Carbon monoxide is a colorless, odorless, and tasteless gas. Mild cases of carbon monoxide poisoning can cause symptoms such as nausea, dizziness or headaches. Severe cases of carbon monoxide poisoning can result in brain damage, heart damage or death. Remember that although CO has no telltale odor, it may mix with other odors that mask its presence; therefore, CO can be present within a mix of seemingly harmless odors. To prevent CO poisoning, ensure that the TRH operating spaces are well ventilated during burner operation. Under no circumstances, should the TRH be operated in any enclosure with all vents closed.

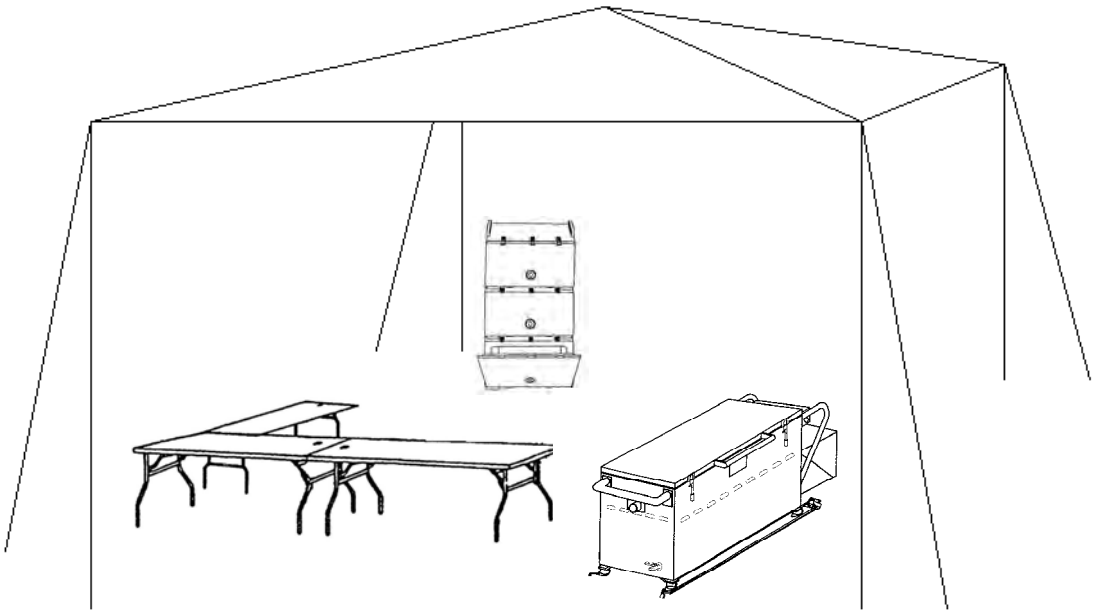


Figure 16. TRHS Equipment Under Shelter (Marine Corps Only).

OPERATING PROCEDURES (MARINE CORPS ONLY) – CONTINUED

Figure 17. TRHS Equipment in Tent or Hard Shelter (Marine Corps Only).

6. Arrange equipment to expedite your feeding plan and begin cooking.

END OF TASK

OPERATING PROCEDURES (MARINE CORPS ONLY) - CONTINUED

Tear Down Serving Line

WARNING

Food waste and food preparation components should never be kept in the same area. Never use the AK to transport discarded tray packs or used mess gear. Failure to observe warnings may lead to bacterial contamination of food service equipment resulting in severe illness or even death.

1. Clean tables and discard open tray packs and disposable mess gear. Repack can opener, beverage containers, cleaned serving utensils and remaining food supplements in the HMMWV.

2. Fold table legs and place tables in their brackets in HMMWV. Place tables in the brackets so folded legs of each table are facing each other as shown in Figure 17. Lock tables in place using the table clamp.

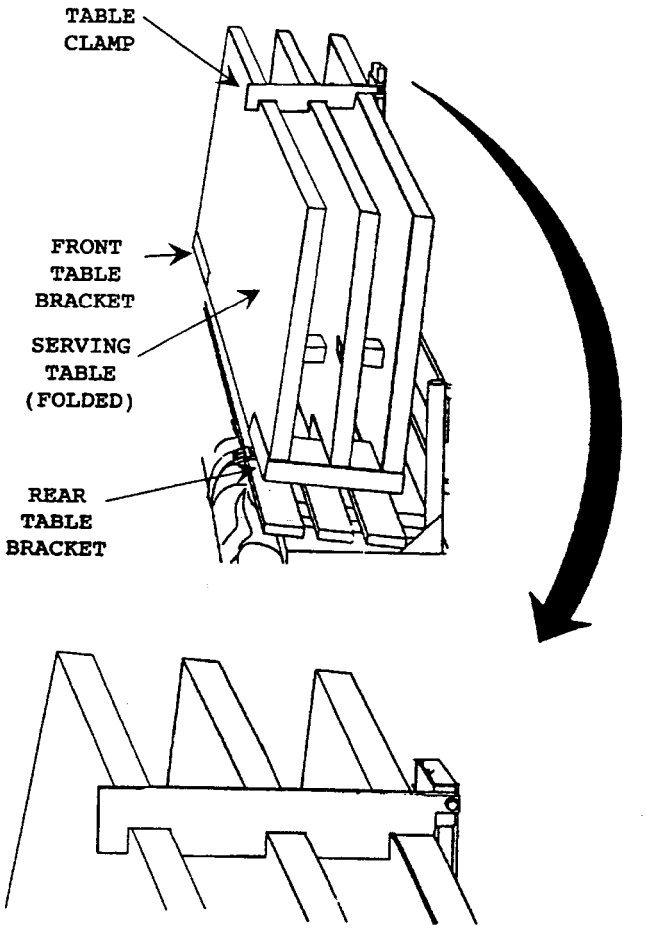


Figure 18. Serving Tables, Stowing Clamp and Bracket (Marine Corps Only).

END OF TASK

END OF WORK PACKAGE

OPERATOR AND FIELD MAINTENANCE

TRAY RATION HEATER (TRH)
OPERATION UNDER USUAL CONDITIONS

INITIAL SETUP:

Tools and Special Tools	Personnel Required
Maintenance Kit (WP 0066, Item 1) Tool Kit (WP 0066, Item 3)	Food Service Specialist 92G (2) Food Service Technician 3381 (2)
Equipment Condition	**References**
TRH Installed IAW WP 0013 - WP 0014	WP 0010 WP 0016 WP 0026 FM 21-11

OPERATING PROCEDURES FOR TRAY RATION HEATER (TRH)

1. Perform PMCS IAW WP 0016.
2. Verify burner assembly is installed on tray ration heater IAW WP 0026.
3. Fill tray ration heater water tank with rations and water so that the water level is approximately 2 inches from the top of the water tank.
4. Close TRH lid and secure latches.

OPERATING PROCEDURES FOR TRAY RATION HEATER (TRH) – CONTINUED

WARNING

Gasoline shall **NOT** be used with the TRH under any circumstance. **Only JP-8 or an approved alternate diesel fuel may be used.** Using gasoline in the TRH will create a fire danger and potential for explosion. Failure to observe safety precautions may result in injury or death to personnel.

WARNING

Do not attempt to connect a fuel line to the TRH in the vicinity of any open flame. Ensure that the fuel hose connections are made properly to avoid fuel spillage. Prevent a possible fire hazard by having absorbent materials or fuel mats on hand to absorb any spillage. Failure to observe safety precautions may result in injury or death to personnel.

5. Place dip tube on fuel can adapter by pressing dip tube into adapter tube fitting until it seats. Install fuel can adapter (Figure 1, Item 1) on fuel can by screwing adapter onto fuel can.

NOTE

Older fuel cans have a vent cock to allow for easy fuel flow. If the fuel can being used is fitted with a vent cock, refer to step 6. If using a newer, self-venting fuel can adapter, skip to step 7.

6. If necessary, vent fuel can by loosening vent cock on top of can adapter. Loosen vent cock by turning counter-clockwise to fully open position (Figure 1, Item 2).

Figure 1. Fuel Can Adapter and Vent Cap.

OPERATING PROCEDURES FOR TRAY RATION HEATER (TRH) - CONTINUED

WARNING

Do not attempt to connect a fuel line to the TRH in the vicinity of any open flame. Ensure that the fuel hose connections are made properly to avoid fuel spillage. Prevent a possible fire hazard by having absorbent materials or fuel mats on hand to absorb any spillage. Failure to observe safety precautions may result in injury or death to personnel.

7. Connect fuel line (Figure 2, Item 1) to fuel can and TRH using two quick disconnect fittings (Figure 2, Item 2). Fuel filter (Figure 2, Item 3) shall be closer to the fuel can than to the TRH.

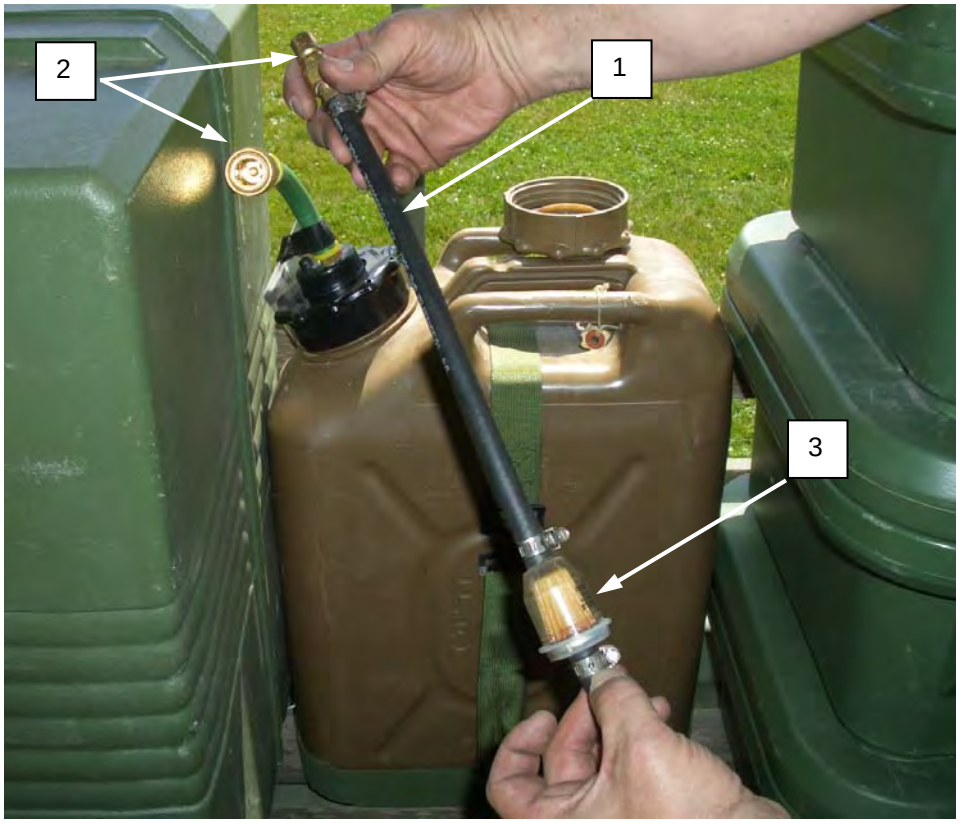


Figure 2. Fuel Line Connection.

OPERATING PROCEDURES FOR TRAY RATION HEATER (TRH) – CONTINUED

WARNING

HIGH VOLTAGE is used in the operation of this equipment. **DEATH ON CONTACT** may result if personnel fail to observe safety precautions. Never work on electrical equipment unless there is at least one other person nearby who is familiar with the operation and hazards of the equipment. That person shall also be competent in giving first aid. Ask maintenance personnel about any hazardous features of the TRH or MBU prior to doing any maintenance. Whenever possible, external power must be shut off before performing any maintenance. Be careful not to contact high-voltage connections when removing, installing or operating this equipment. Whenever possible, keep one hand away from the equipment to reduce the hazard of current flowing through vital organs of the body. Voltages as low as 50 volts may cause death.

For artificial respiration, refer to FM 21-11.

Do not stand in water while handling live power cords or electrical shock may result. Position all power cables so that they are out of the way during operation and are not in water.

8. Connect TRH power cord to coupling on TRH electrical control box (Figure 3, Item 1) and the GFCI outlet on the power inverter (Figure 3, Item 2).

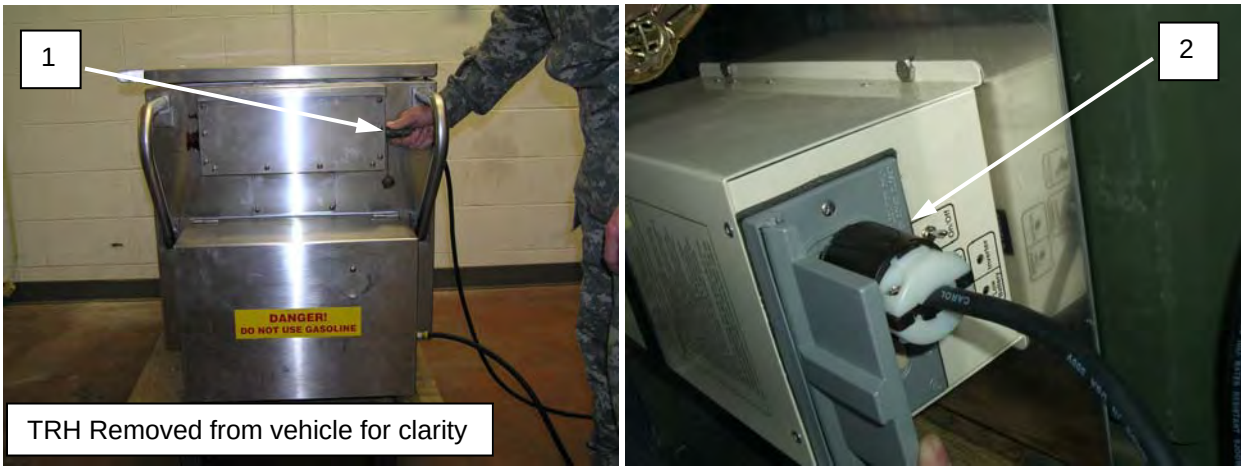


Figure 3. TRH Power Connections.

OPERATING PROCEDURES FOR TRAY RATION HEATER (TRH) – CONTINUED

9. Ensure circuit breaker (Figure 4, Item 1) on TRH Power Inverter is depressed and ON/OFF switch (Figure 4, Item 2) is set to the ON position.

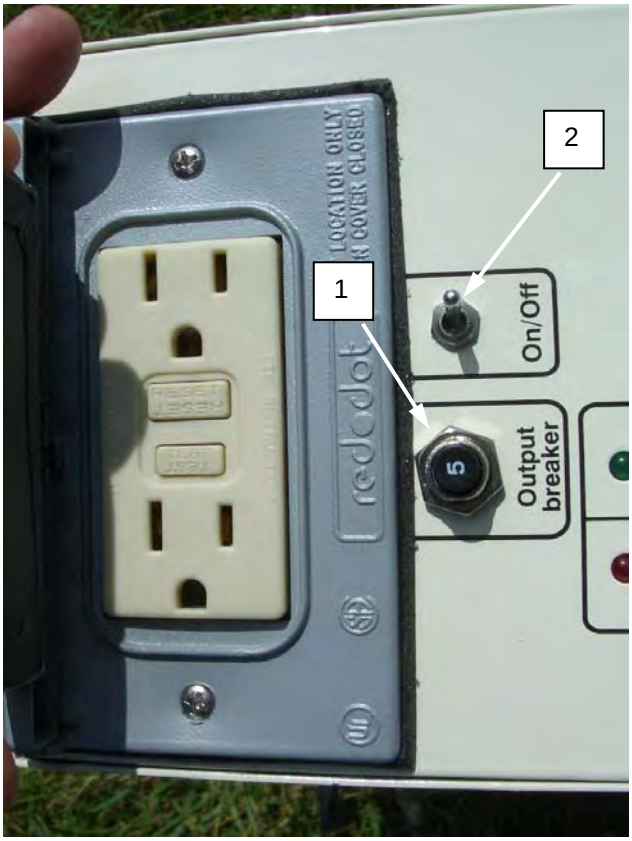


Figure 4. TRH Power Inverter.

WARNING

Never use the “BOIL” mode to prepare rations as it bypasses built in safety features and may cause personnel to be burned by vented steam or scalding can contents. Never leave the TRH unattended when operating in the “BOIL” mode. Water may ”boil over” causing injury to personnel.

10. Ensure AUTO/BOIL switch on TRH electrical control box is in the AUTO position.

OPERATING PROCEDURES FOR TRAY RATION HEATER (TRH) - CONTINUED

11. Remove TRH Burner cover.

12. Ensure fuel flow control screw is set between “M” and “H” (Figure 5, Item 1).

13. Ensure combustion air control knob is set between 9 and 10 (Figure 5, Item 2).

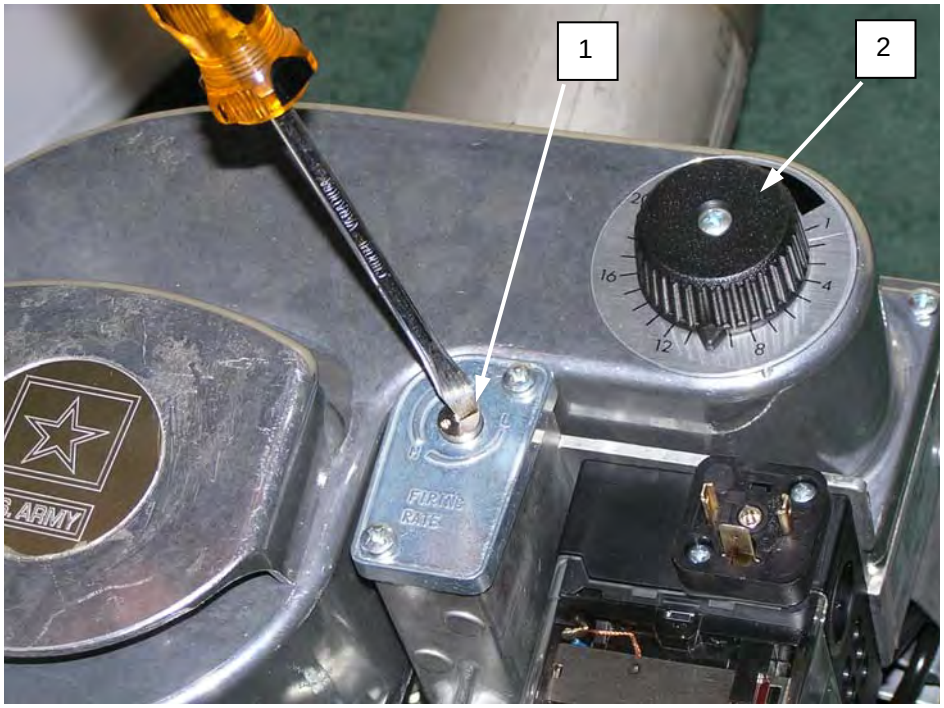


Figure 5. Fuel Flow and Air Flow Controls.

14. Pull the red, on/off light switch on TRH to ON position (Figure 6, Item 1).

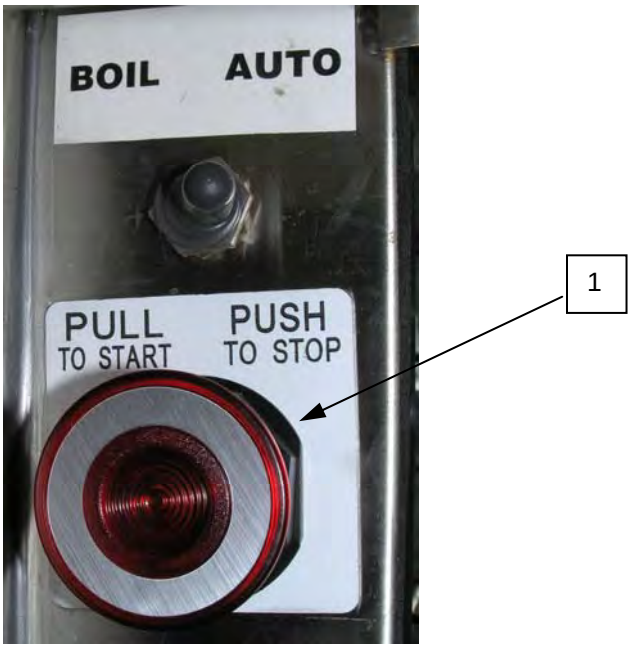


Figure 6. Red, Pull-On/Push-Off Switch.

OPERATING PROCEDURES FOR TRAY RATION HEATER (TRH) - CONTINUED

15. If TRH burner does not start, the burner will go into “lockout” and the reset button (Figure 7, Item 1) on the control box will illuminate with an amber LED light.

Figure 7. TRH Burner Control Box Reset Button.

16. Wait 60 seconds before resetting the relay. While depressing the starting button inlet valve (Figure 8, Item 1) and simultaneously closing off the finger priming port (Figure 8, Item 2) with a finger, depress TRH Burner control box reset button (Figure 7, Item 1). Hold input valve and cover finger priming port for 10 seconds.

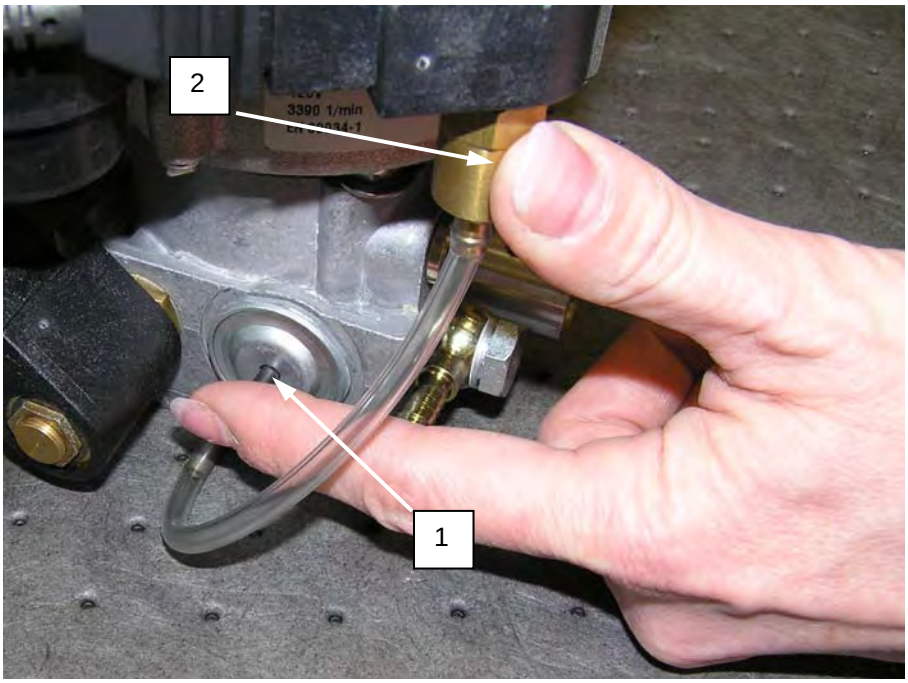


Figure 8. Priming Procedure.

OPERATING PROCEDURES FOR TRAY RATION HEATER (TRH) – CONTINUED

17. In a dry system (no fuel in TRH burner or fuel line), the priming process may be required up to 3 times. If the burner does not prime and light off after 3 priming attempts, trouble-shooting steps shall be taken to determine the cause IAW WP 0010.

18. After ignition, observe TRH burner is functioning properly.

19. Allow tray packs to heat to 180°F.

20. After tray rations are heated they can be placed in the IFCs for serving or in the SLPCs for storage.

END OF TASK

END OF WORK PACKAGE

OPERATOR AND FIELD MAINTENANCE

OPERATION UNDER UNUSUAL CONDITIONS

INITIAL SETUP:

Tools and Special Tools

Maintenance Kit (WP 0066, Item 1)
Tool Kit (WP 0066, Item 3)

Personnel Required

Food Service Specialist 92G (2)
Food Service Technician 3381 (2)

References

FM 4-25.11
TM 10-7310-281-13&P

Equipment Condition

All equipment shall be serviceable and ready for use.

OPERATION IN UNUSUAL ENVIRONMENT/WEATHER CONDITIONS

Precautions can be taken to protect the Assault Kitchen from the effects of severe weather and to minimize potentially dangerous conditions. The following steps are designed to prevent damage and avoid possible injury to personnel.

High Winds/Dust

During operation in windy and dusty conditions:

- If possible, park vehicle facing into the wind.

WARNING

During operation, the TRH produces harmful carbon monoxide (CO) and other gases. Carbon monoxide is a colorless, odorless, and tasteless gas. Mild cases of carbon monoxide poisoning can cause symptoms such as nausea, dizziness or headaches. Severe cases of carbon monoxide poisoning can result in brain damage, heart damage or death. Remember that although CO has no telltale odor, it may mix with other odors that mask its presence; therefore, CO can be present within a mix of seemingly harmless odors. To prevent CO poisoning, ensure that the TRH operating spaces are well ventilated during burner operation. Under no circumstances, should the TRH be operated in any enclosure with all vents closed.

- Keep area of TRH operation well ventilated, leave flap of vehicle or trailer cargo bed cover open during operation.
- Operate MBU in windy conditions IAW TM 10-7310-281-13&P.
- Keep equipment under cover or indoors when not in use.
- Keep QD fuel line connections connected whenever possible to prevent sand and dust intrusion.
- Ensure fuel cans are tightly capped to prevent fuel from being contaminated.
- Ensure food and beverage containers are tightly sealed to prevent contamination.

OPERATION IN UNUSUAL ENVIRONMENT/WEATHER CONDITIONS - CONTINUED

- Wipe equipment down more frequently to keep as clean as possible.

Rain/Wet Climate

During operation in rain and in wet climates:

- Use foul weather canvas (If equipped).
- Check cables for secure connections.
- Avoid letting electrical cable connections remain in running or standing water.
- Keep TRH and Power Inverter out of the rain.

WARNING

During operation, the TRH produces harmful carbon monoxide (CO) and other gases. Carbon monoxide is a colorless, odorless, and tasteless gas. Mild cases of carbon monoxide poisoning can cause symptoms such as nausea, dizziness or headaches. Severe cases of carbon monoxide poisoning can result in brain damage, heart damage or death. Remember that although CO has no telltale odor, it may mix with other odors that mask its presence; therefore, CO can be present within a mix of seemingly harmless odors. To prevent CO poisoning, ensure that the TRH operating spaces are well ventilated during burner operation. Under no circumstances, should the TRH be operated in any enclosure with all vents closed.

- Keep area of TRH operation well ventilated, leave flap of vehicle or trailer cargo bed cover open during operation.
- Keep TRH and power inverter out of the rain.
- For extended periods of rain/moisture, it may be necessary to remove the TRH Control Box and store it in a dry place when the system is not in operation.
- Operate MBU in rain/wet conditions IAW TM 10-7310-281-13&P.

OPERATION IN UNUSUAL ENVIRONMENT/WEATHER CONDITIONS - CONTINUED

Snow and Extreme Cold

During operation in snow and extreme cold:

WARNING

During operation, the TRH produces harmful carbon monoxide (CO) and other gases. Carbon monoxide is a colorless, odorless, and tasteless gas. Mild cases of carbon monoxide poisoning can cause symptoms such as nausea, dizziness or headaches. Severe cases of carbon monoxide poisoning can result in brain damage, heart damage or death. Remember that although CO has no telltale odor, it may mix with other odors that mask its presence; therefore, CO can be present within a mix of seemingly harmless odors. To prevent CO poisoning, ensure that the TRH operating spaces are well ventilated during burner operation. Under no circumstances, should the TRH be operated in any enclosure with all vents closed.

- Keep area of TRH operation well ventilated, leave flap of vehicle or trailer cargo bed cover open during operation.
- Protect fuel supply from exposure to extreme cold whenever possible.
- Do not touch metal with bare hands.
- Monitor vehicle battery charge.
- Leave QD connections connected as much as possible. Gasket in QD fittings can be hard to compress in cold weather.
- Ensure the tank lid gasket is sealing properly and preventing unnecessary heat loss from the tank.
- If the TRH is used once every 24 hours, no restrictions or special requirements apply when operating within 0°F to 32°F. The insulated tank and latched tank lid will maintain water temperature above 32°F. Ensure the tank lid gasket is sealing properly and preventing unnecessary heat loss. Monitor tank water temperature with pocket thermometer during periods when TRH is not in use.
- If the TRH is used less than once every 24 hours, the tank should be drained after each use and then refilled as required when operating between 0°F to 32°F.
- Operate MBU in snow and extreme cold IAW TM 10-7310-281-13&P.

NOTE

In extreme cold temperatures, the fuel may gel or freeze in the air filter. Use DFA or remove the fuel filter if fuel delivery problems due to cold weather occur.

The TRH is designed to operate effectively in cold weather down to –25°F. Special precautions must be taken when operating in extreme cold temperatures (–25°F to 0°F). Prior to operating the burner below 0°F, run the burner for ten minutes using Diesel Fuel Arctic (DFA) to purge the fuel line of non-artic fuel. No further adjustments are required. Burn JP-8 or arctic diesel (DFA).

OPERATION IN UNUSUAL ENVIRONMENT/WEATHER CONDITIONS - CONTINUED

Extreme Heat

During operation in extremely hot conditions:

WARNING

The TRH gives off heat when in operation. During operation, personnel shall exercise caution to prevent heat induced illnesses such as heat stroke and heat exhaustion. Keep area of operation ventilated and away from direct sunlight as much as possible. Refer to FM 4-25.11 for first aid treatment of heat induced illnesses. Failure to observe warnings may result in injury or death to personnel.

- Keep equipment shaded whenever possible.

WARNING

During operation, the TRH and MBU produce harmful carbon monoxide (CO) and other gases. Carbon monoxide is a colorless, odorless, and tasteless gas. Mild cases of carbon monoxide poisoning can cause symptoms such as nausea, dizziness or headaches. Severe cases of carbon monoxide poisoning can result in brain damage, heart damage or death. Remember that although CO has no telltale odor, it may mix with other odors that mask its presence; therefore, CO can be present within a mix of seemingly harmless odors. To prevent CO poisoning, ensure that the TRH and MBU operating spaces are well ventilated during burner operation. Under no circumstances, should the TRH be operated in any enclosure with all vents closed.

- Keep area of TRH operation well ventilated, leave flap of vehicle or trailer cargo bed cover open during operation.

WARNING

DO NOT touch hot metal surfaces with bare hands. Failure to observe warnings may result in injury or death to personnel.

- Do not touch hot metal surfaces with bare hands.

WARNING

Be aware that fuel expands as the temperature rises - do not store TRH or fuel cans when full of fuel, where it is exposed to the sun for long periods. Failure to observe warnings may result in injury or death to personnel.

- Do not store TRH or fuel can when full of fuel, where it is exposed to the sun for long periods.
- Operate MBU in extreme heat IAW TM 10-7310-281-13&P.

High Altitude

- No special adjustments are required for AK operations at high altitudes.
- Operate MBU at high altitude IAW TM 10-7310-281-13&P.

OPERATION IN UNUSUAL ENVIRONMENT/WEATHER CONDITIONS - CONTINUED

Salt Water Areas

- Keep equipment free from contact with salt water.
- If equipment does come in contact with salt water, clean with fresh water.
- Operate MBU in salt water areas IAW TM 10-7310-281-13&P.

END OF WORK PACKAGE

OPERATOR AND FIELD MAINTENANCE

CLEANING

INITIAL SETUP:

Materials/Parts	Personnel Required
Brush, Scrub (WP 0065, Item 3) Detergent, General Purpose (WP 0065, Item 6) Pad, Scouring (WP 0065, Item 12) Rag, Wiping (WP 0065, Item 13)	Food Service Specialist 92G (2) Food Service Technician 3381 (2)
References	**Equipment Condition**
FM 10-23	TRH Burner turned OFF TRH Tank Empty

CLEANING

Food Service Equipment

The primary method in which AK components should be cleaned is using the available base area sanitation equipment (FSC, etc.) of the associated higher level kitchen support. For situations where sanitation equipment is not available, refer to FM 10-23 and use the following field sanitation procedures.

1. Prepare three “sinks” using three empty IFCs and hot water from the TRH tank. Fill each IFC with hot water and set aside one IFC each for WASH, RINSE, and SANITIZE cleaning “sinks”.
2. Before cleaning with hot soapy water, remove any excess dirt, or food particles by scraping or scrubbing with a scrub brush or scouring pad.
3. Use a biodegradable liquid detergent that is suitable for the cleaning of food service surfaces. Follow directions outlined by detergent instructions.
4. Mix detergent IAW product instructions in the IFC set aside for washing.
5. Scrub food service equipment in the WASH “sink” with a clean rag, sponge, or brush to rid equipment of dirt or food particles.
6. Rinse with clean water from the RINSE “sink” until all soap residue is gone.
7. Repeat steps 5 and 6 as necessary.
8. Sanitize food service equipment with hot water in the SANITIZE “sink”.

END OF TASK

CLEANING - CONTINUED

Tray Ration Heater (TRH)

Frequent cleaning of the TRH interior will prevent the build up of lime and scale deposits which may interfere with the proper functioning of the low water sensor. The TRH tank water may be used multiple times for heating rations and should only be drained and cleaned when the tank water is dirty. To clean the TRH use the following procedures:

1. Clean exterior of TRH tank with warm water.

2. Clean interior of tank with a scouring pad and clean water to remove mineral deposits.

3. Thoroughly rinse interior with clean water and drain.

4. Inspect low water sensor to ensure it is not obstructed by dirt, debris, or mineral deposits.

END OF TASK

END OF WORK PACKAGE

CHAPTER 3

TROUBLESHOOTING MASTER INDEX FOR ASSAULT KITCHEN

OPERATOR AND FIELD MAINTENANCE

MALFUNCTION SYMPTOM INDEX

TROUBLESHOOTING INDEX

The malfunction symptom index lists common malfunctions that may occur during Assault Kitchen inspections and operations. Find the malfunction to be eliminated and go to the indicated troubleshooting work package that follows. For personnel authorized to perform operator maintenance, refer to WP 0010 to perform operator maintenance. For service maintenance personnel, refer to operator maintenance WP 0010 to perform operator maintenance first. If after performing operator level troubleshooting the malfunction is not corrected, refer to WP 0011, service maintenance troubleshooting work package.

The index cannot list all malfunctions that may occur, all tests or inspections needed to find the fault, nor all actions required to correct the fault. If the existing malfunction is not listed, or cannot be corrected through this troubleshooting index, notify service maintenance.

Table 1. Malfunction Symptom Index.

Symptom	Operator Maintenance Troubleshooting Work Package/Page No.	Service Maintenance Troubleshooting Work Package/Page No.
1. With Pull-ON/Push-OFF knob in the ON position and the TRH Pull-ON/Push-OFF indicator light not lit, nothing happens.	WP 0010	WP 0011
2. With Pull-ON/Push-OFF knob in the ON position and the TRH Pull-ON/Push-OFF indicator light lit, nothing happens.	WP 0010	N/A
3. With Pull-ON/Push-OFF knob in the ON position, TRH attempts to start but does not or TRH is running normally and then stops.	WP 0010	WP 0011
4. TRH Burner does not install in TRH Tank.	WP 0010	WP 0011
5. Fuel has leaked out of the system.	WP 0010	WP 0011
6. Excess steam when TRH lid is closed.	WP 0010	WP 0011
7. TRH Burner emits smoke.	WP 0010	WP 0011
8. TRH Burner motor makes scraping noise.	WP 0010	WP 0011

END OF WORK PACKAGE

CHAPTER 4

OPERATOR TROUBLESHOOTING PROCEDURES FOR ASSAULT KITCHEN

OPERATOR MAINTENANCE

TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Tools and Special Tools

Maintenance Kit (WP 0066, Item 1)
Tool Kit (WP 0066, Item 3)

Personnel Required

Food Service Specialist 92G (2)
Food Service Technician 3381 (2)

Materials/Parts

Absorbent Material, Oil and Water (WP 0065, Item 1)
Gloves, Chemical and Oil Protective (WP 0065, Item 9)
Rag, Wiping (WP 0065, Item 13)

References

WP 0008 WP 0018 WP 0019 WP 0021 WP 0022 WP 0026 WP 0027 WP 0028 WP 0040 FM 21-11

TROUBLESHOOTING PROCEDURE

TRAY RATION HEATER (TRH)

SYMPTOM

With Pull-ON/Push-OFF knob in the ON position and the TRH Pull-ON/Push-OFF indicator light not lit, nothing happens.

MALFUNCTION

Electrical power from the source to the TRH Burner has been interrupted.

CORRECTIVE ACTION

STEP 1. On the TRH Tank, check the following:

WARNING

HIGH VOLTAGE is used in the operation of this equipment. **DEATH ON CONTACT** may result if personnel fail to observe safety precautions. Never work on electrical equipment unless there is at least one other person nearby who is familiar with the operation and hazards of the equipment. That person should also be competent in giving first aid. Be careful not to contact high-voltage connections when performing checks on this equipment. Whenever possible, keep one hand away from the equipment to reduce the hazard of current flowing through vital organs of the body. Voltages as low as 50 volts may cause death.

For artificial respiration, refer to FM 21-11.

Do not stand in water while handling live power cords or electrical shock may result. Position all power cables so that they are out of the way during operation and are not in water.

a. Ensure twist lock power connection from power cord to TRH tank is secure and properly connected. Reconnect an unsecured connection.

b. Ensure circuit breaker on TRH Tank is not tripped by depressing the circuit breaker reset button.

STEP 2. Following the power cord from the TRH Tank to the inverter, check:

a. TRH power cord for obvious signs of damage. If damaged, replace the TRH power cord IAW WP 0021.

TROUBLESHOOTING PROCEDURE - CONTINUED

b. TRH power cord connection to Inverter GFCI outlet (Figure 1, Item 1) for secure connection. Reconnect an unsecured connection.

STEP 3. On the TRH Inverter, perform the following checks:

a. Verify power connections to vehicle are secure. Reconnect an unsecured connection.

b. Ensure TRH Power Inverter ON/OFF switch is in ON position.

c. Ensure green “Inverter” LED is lit.

(1) If red “Low Battery” LED is lit or no LED is lit, start the vehicle and run the motor to recharge the vehicle battery.

d. Press the reset button on the GFCI receptacle and TRH Inverter output breaker.

e. Replace TRH Inverter (WP 0040).

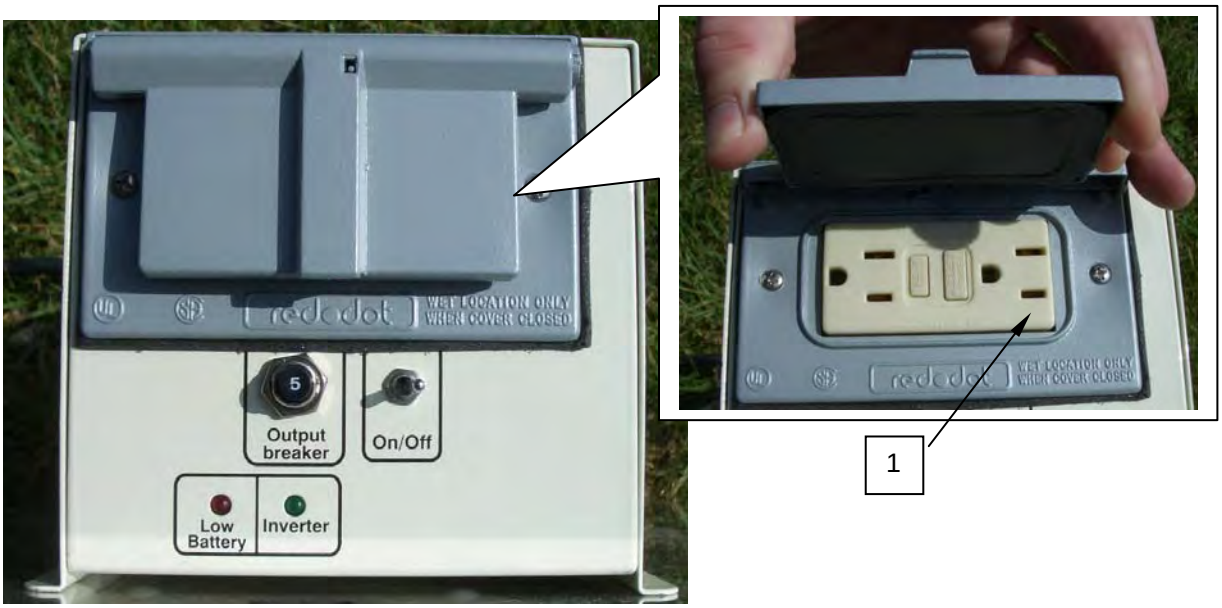


Figure 1. TRH Inverter GFCI Outlet.

STEP 4. Test the TRH power cord by using a different TRH power cord, if available.

a. If using a different TRH power cord fixes the problem, replace the TRH power cord IAW WP 0021.

STEP 5. At this point in the troubleshooting process, the operator has completed the checks that they are authorized to perform. Refer TRH Tank to service maintenance to continue troubleshooting the AK.

TROUBLESHOOTING PROCEDURE - CONTINUED

SYMPTOM

With Pull-ON/Push-OFF knob in the ON position and the TRH Pull-ON/Push-OFF indicator light lit, nothing happens.

MALFUNCTION

Electrical power from the TRH Tank to the TRH Burner has been interrupted.

CORRECTIVE ACTION

STEP 1. Check the TRH Burner control box amber light.

a. If the TRH Burner control box amber light is lit, refer to step 4.

STEP 2. Check TRH tank for the following:

a. Water level shall be above low water sensor.

(2) If water level is below the low water sensor, add water so that water level rises to approximately 2 inches from the top of the water tank.

(3) If water level is above the low water sensor, or adding water to the tank does not fix the problem, ensure that the low water sensor is clean IAW WP 0008.

b. Use a pocket thermometer from the utensil kit to measure TRH Tank water temperature. Temperature should be below 180°F.

WARNING

Never use the “BOIL” mode to prepare rations as it bypasses built-in safety features and may cause personnel to be burned by vented steam or scalding can contents. Never leave the TRH unattended when operating in the “BOIL” mode. Water may ”boil over” causing injury to personnel.

(1) If water temperature is above 180°F, the TRH should not attempt to start. This is a safety feature. To test TRH, set the TRH Tank toggle switch to the BOIL mode. The TRH should start.

c. Ensure TRH tank is not tilted past 30° (one skid elevated more than 1 ft. above the other). If TRH Tank is tilted past 30°, the tilt switch in the TRH Tank will disable TRH operations until TRH Tank is returned to a level state. This is a safety feature of the TRH and not a malfunction.

STEP 3. Lift TRH Burner cover and visually inspect the power connection between the TRH Tank and the TRH Burner to ensure the power plug connection is secure. If not secured, attach the TRH burner power plug connection using the retaining screw on the TRH Burner power plug.

STEP 4. Remove TRH Burner from TRH Tank IAW WP 0026.

a. Check to ensure photocell is properly installed IAW WP 0028.

b. Replace TRH Burner in TRH Tank IAW WP 0026.

STEP 5. Remove the TRH Burner control box and install spare TRH Burner control box from maintenance kit IAW WP 0027.

a. If the TRH functions properly with the new TRH Burner control box installed, the malfunction was with the old TRH Burner control box. Turn-in the old TRH Burner control box.

STEP 6. Use the TRH Burner diagnostic test box to determine if the problem is with the TRH tank electronics or TRH Burner.

TROUBLESHOOTING PROCEDURE - CONTINUED

a. To determine which component is malfunctioning, place TRH tank red Pull-ON/Push-OFF knob in OFF position and replace the burner control box with the diagnostic test box.

(1) Remove the TRH burner control box from the TRH Burner (Figure 2, Item 1) by loosening the retaining screw and pulling control box away from TRH Burner.

WARNING

When using the diagnostic test box to test the TRH Burner, be careful to observe the condition of the test switches on the test box. All switches shall be in the OFF (O) position. Failure to observe this warning may cause unexpected TRH burner start-up resulting in injury or death to personnel.

(2) Install diagnostic test box (Figure 2, Item 2) on TRH Burner and secure using the integral screw (Figure 2, Item 3).

(3) Pull TRH tank red Pull-ON/Push-OFF knob to ON position.

(a) If amber colored LINE light (Figure 2, Item 4) on diagnostic test box is lit, the TRH tank electronics are working properly and the malfunction exists in the TRH burner. Remove TRH Burner IAW WP 0028 and replace with spare TRH Burner in maintenance kit. Refer malfunctioning TRH Burner and maintenance kit to service maintenance.

(b) If amber colored LINE light (Figure 2, Item 4) on diagnostic test box is not lit, the malfunction exists in the TRH tank electronics. Refer TRH tank to service maintenance.

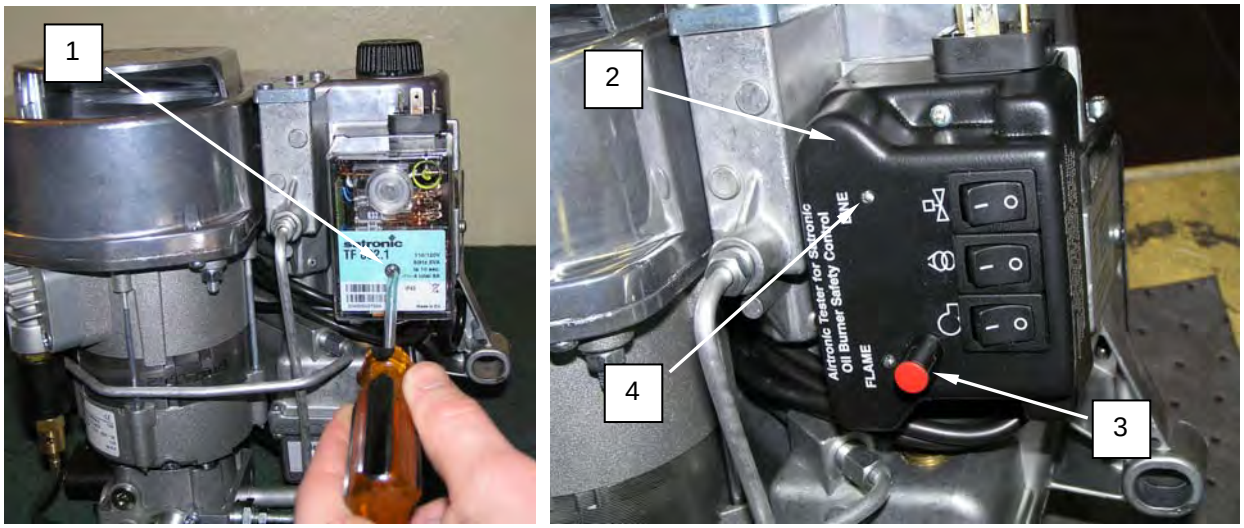


Figure 2. Replacing Electrical Control Box With Diagnostic Test Box.

SYMPTOM

With Pull-ON/Push-OFF knob in the ON position, TRH attempts to start but does not or TRH is running normally and then stops.

MALFUNCTION

Fuel flow problems have stopped the TRH during operation or have prevented the TRH from starting properly.

CORRECTIVE ACTION

STEP 1. Check status of TRH Burner control box for lock-out (Amber light on TRH Burner control box is lit). If TRH Burner is not locked out, fuel flow problems have been ruled out. Proceed to the next malfunction to continue troubleshooting. If TRH Burner is locked out, proceed to STEP 2.

STEP 2. Wait 60 seconds to allow the TRH Burner to cool down, Remove cover and attempt to restart the TRH by pushing the reset button on the TRH Burner control box (Figure 3, Item 1).

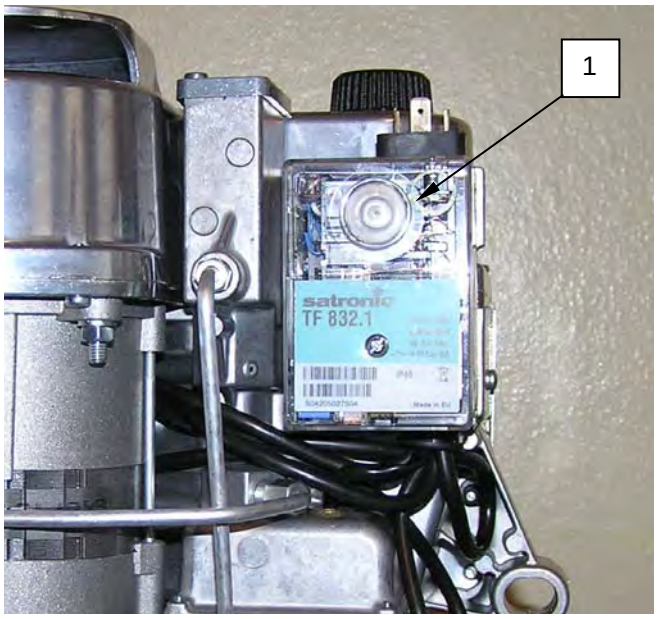


Figure 3. TRH Control Box Reset Button.

TROUBLESHOOTING PROCEDURE - CONTINUED

WARNING

Do not attempt to connect a fuel line to the TRH in the vicinity of any open flame. Ensure that the fuel hose connections are made properly to avoid fuel spillage. Prevent a possible fire hazard by having absorbent materials or fuel mats on hand to absorb any spillage. Failure to observe safety precautions may result in injury or death to personnel.

STEP 3. Repeat the previous step while depressing the starting button inlet valve for 10 seconds (Figure 4, Item 1). Simultaneously close off the finger priming port (Figure 4, Item 2) with a finger to further enhance the priming process. Repeat for up to 3 attempts.

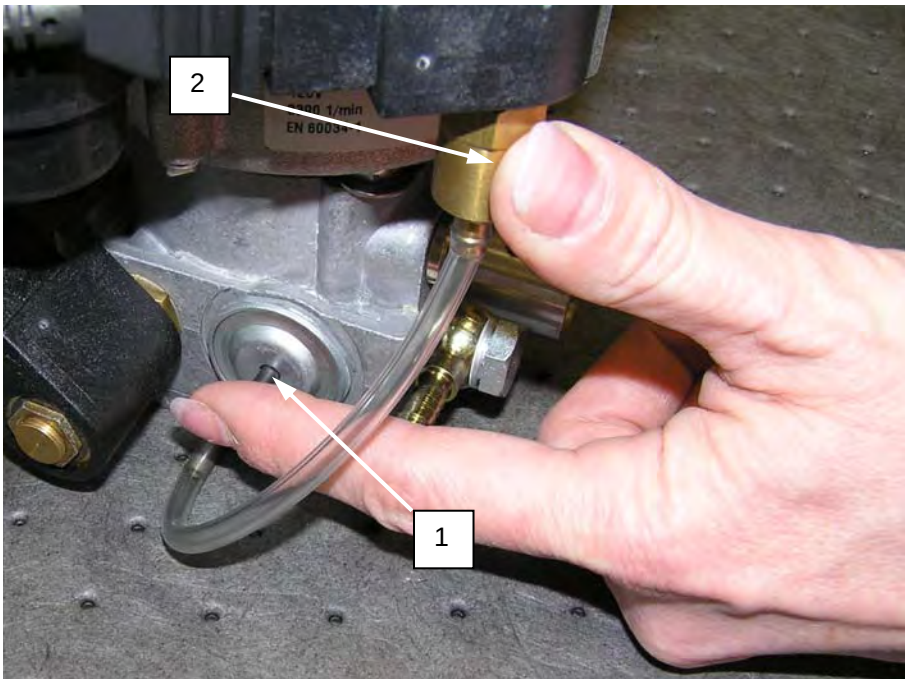


Figure 4. Priming Procedure.

STEP 4. Troubleshoot the fuel delivery system from the fuel can to the TRH burner by checking the following:

a. Ensure fuel level in fuel can is at least 1/4 of fuel can. Fill as necessary.

b. Fuel can adapter properly installed on fuel can (WP 0018) and not damaged. Replace a damaged fuel can adapter (WP 0018).

c. Fuel can adapter plastic dip tube installed correctly (WP 0018) and not kinked or damaged. Replace a damaged dip tube and reconnect any unsecured connection.

d. (USMC Only) Fuel can adapter air vent open (WP 0018). Open fuel adapter vent cock.

e. Fuel line cut, damaged, bent, or kinked. Replace a defective fuel line.

f. QD fuel line connection on TRH Tank is properly connected and not damaged. If damaged, replace the fuel line.

TROUBLESHOOTING PROCEDURE - CONTINUED

g. Ensure TRH internal fuel line connection from TRH tank to TRH Burner is properly connected. Reconnect an unsecured connection.

h. Ensure fuel filter hose clamps are properly installed (tightened enough to keep fuel from escaping, but not so tight that fuel flow is impeded). Adjust hose clamps as necessary.

i. Check fuel filters for clogs or damage to filters. Replace any clogged or damaged fuel filter (WP 0019).

j. Ensure fuel and air settings on burner are set properly. TRH Burner should be set to “M” on fuel control knob (Figure 5, Item 1) and “10” on air control knob (Figure 5, Item 2). Adjust fuel and air control settings as necessary.

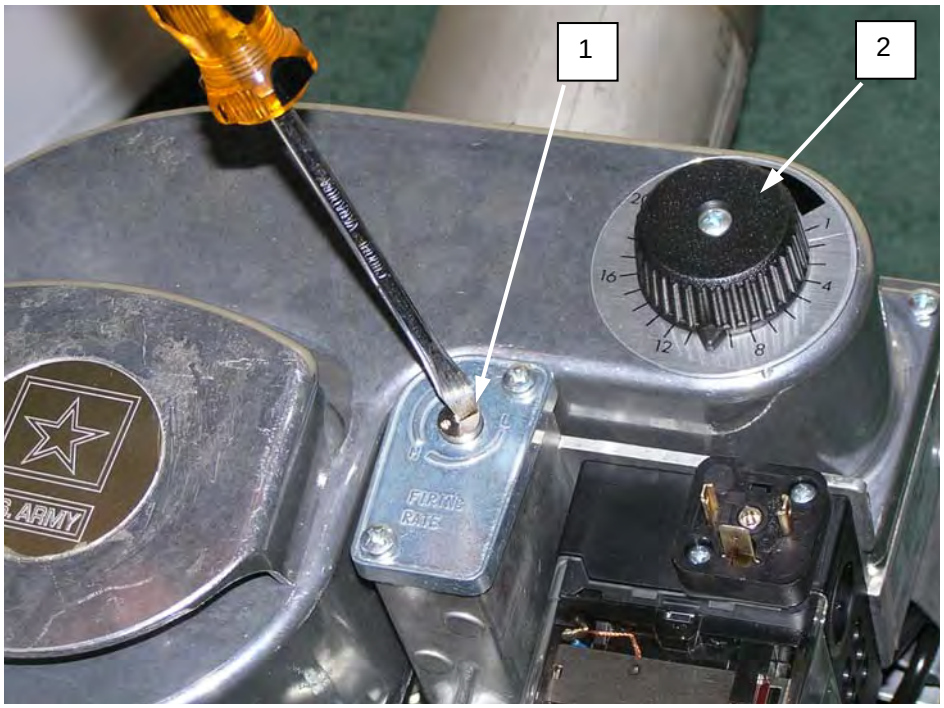


Figure 5. Fuel Flow and Air Flow Controls.

k. At this point in the troubleshooting process fuel flow problems have been ruled out. Proceed to the next malfunction to continue troubleshooting.

TROUBLESHOOTING PROCEDURE - CONTINUED

MALFUNCTION

The photocell on the TRH Burner is misaligned or improperly installed causing the TRH Burner to lock out.

CORRECTIVE ACTION

STEP 1. Remove TRH Burner cover and remove TRH Burner IAW WP 0026 but do not drain the fuel.

STEP 2. Check the photocell (Figure 6, Item 1) on the TRH Burner for proper alignment and installation. Verify alignment IAW WP 0028 and reinstall if necessary.

STEP 3. Attempt to operate the TRH using another photocell from the TRH maintenance kit or spare TRH burner. Do not turn in the original photocell unless the TRH operates properly with the replacement photocell.

Figure 6. Photocell Orientation.

STEP 3. At this point in the troubleshooting process photocell alignment problems have been ruled out, proceed to the next malfunction to continue troubleshooting.

TROUBLESHOOTING PROCEDURE - CONTINUED

MALFUNCTION

The TRH Burner control box has malfunctioned due to damage, corrosion, or moisture.

CORRECTIVE ACTION

WARNING

HIGH VOLTAGE is used in the operation of this equipment. **DEATH ON CONTACT** may result if personnel fail to observe safety precautions. Never work on electrical equipment unless there is at least one other person nearby who is familiar with the operation and hazards of the equipment. That person should also be competent in giving first aid. Ask maintenance personnel about any hazardous features of the TRH prior to doing any maintenance. Whenever possible, external power must be shut off before performing any maintenance. Be careful not to contact high-voltage connections when removing, installing or operating this equipment. Whenever possible, keep one hand away from the equipment to reduce the hazard of current flowing through vital organs of the body. Voltages as low as 50 volts may cause death.

For artificial respiration, refer to FM 21-11.

Do not stand in water while handling live power cords or electrical shock may result. Position all power cables so that they are out of the way during operation and are not in water.

STEP 1. Remove the TRH Burner cover and check the TRH Burner control box for obvious signs of damage, corrosion, or internal dampness. Replace a damaged, corroded, or water damaged TRH Burner control box (WP 0027).

STEP 2. Remove the TRH Burner control box and install a spare TRH Burner control box (WP 0027) from the maintenance kit.

a. If the TRH functions properly with the spare TRH Burner control box installed, the malfunction was with the old TRH Burner control box. Discard the old TRH Burner control box.

b. Check status of replacement TRH Burner control box for lock-out (Amber light on TRH Burner control box is lit). If TRH Burner is locked out, replace TRH burner with spare TRH burner from the maintenance kit and refer malfunctioning TRH burner to service maintenance.

STEP 3. At this point in the troubleshooting process, if the TRH burner control box is not locked out (Amber light on TRH Burner control box is not lit), the malfunction cannot be determined, proceed to the next malfunction to continue troubleshooting.

TROUBLESHOOTING PROCEDURE - CONTINUED

MALFUNCTION

TRH attempts to start but does not or TRH is running normally and then stops with Pull-ON/Push-OFF indicator light not lit signifying electrical problems between the power source and TRH Burner have stopped the TRH during operation or have prevented the TRH from starting properly.

CORRECTIVE ACTION

STEP 1. Check the TRH Tank by checking the following:

WARNING

HIGH VOLTAGE is used in the operation of this equipment. **DEATH ON CONTACT** may result if personnel fail to observe safety precautions. Never work on electrical equipment unless there is at least one other person nearby who is familiar with the operation and hazards of the equipment. That person should also be competent in giving first aid. Be careful not to contact high-voltage connections when performing checks on this equipment. Whenever possible, keep one hand away from the equipment to reduce the hazard of current flowing through vital organs of the body. Voltages as low as 50 volts may cause death.

For artificial respiration, refer to FM 21-11.

Do not stand in water while handling live power cords or electrical shock may result. Position all power cables so that they are out of the way during operation and are not in water.

a. Twist-lock power connection connecting power cord to TRH tank is secure and properly connected. Reconnect an unsecured connection.

b. Ensure circuit breaker on TRH Tank is not tripped by depressing the circuit breaker reset button.

STEP 2. Following the power cord from the TRH Tank to the inverter, check:

a. TRH power cord for obvious signs of damage. If damaged, replace the TRH power cord (WP 0021).

b. Power connection to Power Inverter GFCI outlet for secure connection. Reconnect an unsecured connection.

STEP 3. On the TRH Inverter, perform the following checks:

a. Verify power connections to vehicle are secure. Reconnect an unsecured connection.

b. Ensure TRH Power Inverter ON/OFF switch is in ON position.

c. Ensure green “Inverter” LED is lit.

(1) If red “Low Battery” LED is lit or no LED is lit, start the vehicle and run the motor to recharge the vehicle battery.

d. Press the reset button on the GFCI receptacle and TRH Inverter output breaker.

e. Replace TRH Inverter (WP 0040).

STEP 4. Test the TRH power cord by using a different TRH power cord.

a. If using a different TRH power cord fixes the problem, replace the TRH power cord (WP 0021).

TROUBLESHOOTING PROCEDURE - CONTINUED

MALFUNCTION

TRH attempts to start but does not or TRH is running normally and then stops with Pull-ON/Push-OFF indicator light lit signifying electrical problems between the TRH Tank and TRH Burner have stopped the TRH during operation or have prevented the TRH from starting properly.

CORRECTIVE ACTION

STEP 1. Check TRH tank for the following:

a. Ensure TRH tank water level is above low water sensor.

(1) If TRH tank water level is below the low water sensor, add water to TRH tank so that water level is approximately 2 inches from the top of the water tank.

(2) If water level is already above the low water sensor, or adding water to the tank does not fix the problem, ensure that the low water sensor is clean IAW WP 0008.

b. Use a pocket thermometer to measure TRH Tank water temperature. Temperature should be below 180°F.

WARNING

Never use the “BOIL” mode to prepare rations as it bypasses built-in safety features and may cause personnel to be burned by vented steam or scalding can contents. Never leave the TRH unattended when operating in the “BOIL” mode. Water may ”boil over” causing injury to personnel.

(1) If water temperature is above 180°F, the TRH should not attempt to start. This is a safety feature. To bypass the safety feature of the TRH, set the TRH Tank toggle switch to the BOIL mode. The TRH should start.

c. Ensure TRH tank is not tilted past 30° (one skid elevated more than 1 ft. above the other). If TRH Tank is tilted past 30°, the tilt switch in the TRH Tank will disable TRH operations until TRH Tank is returned to a level state. This is a safety feature of the TRH and not a malfunction

STEP 2. Visually inspect the power connection between the TRH Tank and the TRH Burner to ensure the power plug connection is secure. If not secured, attach the TRH burner power plug connection using the retaining screw on the TRH Burner power plug.

STEP 3. Remove TRH Burner from TRH Tank IAW WP 0026 but do not drain fuel.

a. Check to ensure photocell is properly installed (WP 0028). Adjust photocell installation as necessary.

b. Replace TRH Burner in TRH Tank IAW WP 0026.

TROUBLESHOOTING PROCEDURE - CONTINUED

STEP 4. Use the TRH Burner diagnostic test box to determine if the problem is with the TRH tank electronics or TRH Burner.

WARNING

Ensure TRH Pull-ON/Push-OFF knob is in the OFF position before replacing the TRH Burner control box. Failure to observe this warning may result in injury or death to personnel.

a. Remove the electrical control box from the TRH Burner (Figure 7, Item 1) by loosening the retaining screw and pulling TRH Burner control box away from TRH Burner.

WARNING

When using the diagnostic test box to test the TRH Burner, be careful to observe the condition of the test switches on the test box. All switches shall be in the OFF (O) position. Failure to observe this warning may cause unexpected TRH burner start-up resulting in injury or death to personnel.

b. Install diagnostic test box (Figure 7, Item 2) on TRH Burner and secure using the integral screw (Figure 7, Item 3).

c. Pull TRH tank red Pull-ON/Push-OFF knob to ON position.

(1) If amber colored LINE light (Figure 7, Item 4) on diagnostic test box is lit, the TRH tank electronics are working properly and the malfunction exists in the TRH burner. Remove TRH Burner IAW WP 0026 and replace with spare TRH Burner in maintenance kit. Refer malfunctioning TRH Burner and maintenance kit to service maintenance.

(2) If amber colored LINE light (Figure 7, Item 4) on diagnostic test box is not lit, the malfunction exists in the TRH tank electronics. Refer TRH tank to service maintenance.

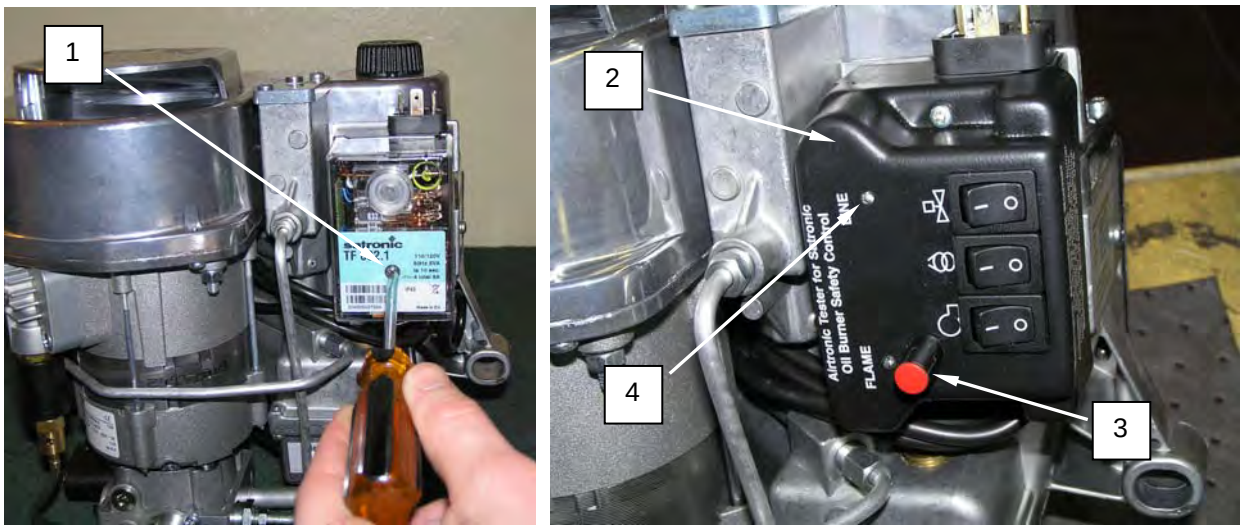


Figure 7. Replacing Electrical Control Box With Diagnostic Test Box.

TROUBLESHOOTING PROCEDURE - CONTINUED

SYMPTOM

TRH Burner does not install in TRH Tank.

MALFUNCTION

The TRH Tank is damaged so that TRH Burner will not fit in burner housing.

CORRECTIVE ACTION

STEP 1. Lift TRH Burner cover and visually check the alignment of the TRH Tank saddle pins located inside the TRH Tank burner housing. Using mechanical means, align saddle pins so that TRH Burner can slide into TRH Tank burner housing.

STEP 2. Check TRH Tank burner housing for damage.

a. If TRH Tank burner housing is bent or dented, attempt to repair damage using TRH tool kit so that TRH Burner is able to be installed in TRH Tank.

b. If TRH Tank burner housing cannot be repaired by TRH Tool kit, the operator has completed the checks that they are authorized to perform. Refer TRH Tank to service maintenance to continue troubleshooting the TRH Tank.

MALFUNCTION

The TRH Burner was improperly assembled or damaged so that it will not fit in the TRH tank or will not assemble properly.

CORRECTIVE ACTION

STEP 1. At this point in the troubleshooting process, the operator has completed the checks that they are authorized to perform. Refer TRH Burner to service maintenance to continue troubleshooting the TRH Burner.

WARNING

Do not attempt to connect a fuel line to the TRH in the vicinity of any open flame. Ensure that the fuel hose connections are made properly to avoid fuel spillage. Prevent a possible fire hazard by having absorbent materials or fuel mats on hand to absorb any spillage. Failure to observe safety precautions may result in injury or death to personnel.

SYMPTOM

Fuel has leaked out of the system.

MALFUNCTION

Fuel has leaked out of the system.

CORRECTIVE ACTION

STEP 1. Check the fuel can and fuel can adapter as follows:

a. Check the fuel can for cracks or other damage that would allow fuel to leak from the fuel can.

b. Check the fuel can adapter for proper installation or damage.

c. Check the QD fitting connecting the fuel can adapter to the fuel hose for secure connection.

TROUBLESHOOTING PROCEDURE - CONTINUED

STEP 2. Check the fuel hose as follows:

a. Check the fuel hose for cuts, cracks, or holes that would allow fuel to leak out of the fuel hose.

b. Check the in line fuel filter on the fuel hose for the following:

(1) Cracks or holes in the filter that would allow fuel to leak out of the fuel filter casing.

(2) Improperly installed hose clamps. Hose clamps should be tight enough to retain fuel filter to fuel hose without allowing fuel leaks but not so tight that fuel flow is restricted.

(3) Check to ensure fuel filter is not dirty or clogged. Replace unserviceable fuel filter IAW WP 0021.

c. Check all QD fittings on the fuel hose for secure connection.

STEP 3. Check the TRH tank as follows:

a. Check the QD fitting connecting the fuel hose to the TRH tank for secure connection.

b. Check the internal fuel hose in the TRH burner housing for cuts, cracks, or holes that would allow fuel to leak out of the fuel hose.

c. Check the in line fuel filter on the internal fuel hose in the TRH burner housing for the following:

(1) Cracks or holes in the filter that would allow fuel to leak out of the fuel filter casing.

(2) Improperly installed hose clamps. Hose clamps should be tight enough to retain fuel filter to fuel hose without allowing fuel leaks but not so tight that fuel flow is restricted.

(3) Check to ensure fuel filter is not dirty or clogged. Replace unserviceable fuel filter IAW WP 0019.

TROUBLESHOOTING PROCEDURE - CONTINUED

STEP 4. Check the TRH burner as follows:

a. Check the connection between the internal fuel hose to the TRH burner for secure connection.

b. Check the TRH burner fuel sump plug (Figure 8, Item 1) for proper installation.

Figure 8. Fuel Sump Plug.

STEP 5. At this point in the troubleshooting process, the operator has completed the checks that they are authorized to perform. Refer TRH Tank to service maintenance to continue troubleshooting.

TROUBLESHOOTING PROCEDURE - CONTINUED

SYMPTOM

Excess steam when TRH lid is closed.

MALFUNCTION

TRH is set to incorrect mode of operation.

CORRECTIVE ACTION

WARNING

Never use the “BOIL” mode to prepare rations as it bypasses built in safety features and may cause personnel to be burned by vented steam or scalding can contents. Never leave the TRH unattended when operating in the “BOIL” mode. Water may ”boil over” causing injury to personnel.

WARNING

The pressure relief port on the back side of the TRH Tank lid vents hot steam. Use caution when working near the TRH Tank when in operation as the high pressure steam that is vented may burn or scald personnel. Failure to observe this warning may result in injury or death to personnel.

NOTE

Wait 10 minutes for tank to cool or steam to dissipate.

STEP 1. Check TRH tank toggle switch (Figure 9, Item 1) to ensure TRH is set to AUTO mode.

a. If toggle switch is set to BOIL mode, place toggle switch in AUTO mode and observe tank operation. Excess steam should slowly reduce until there is a normal amount of steam. If steam is not reduced by placing TRH tank in AUTO mode, proceed to next step in troubleshooting process.

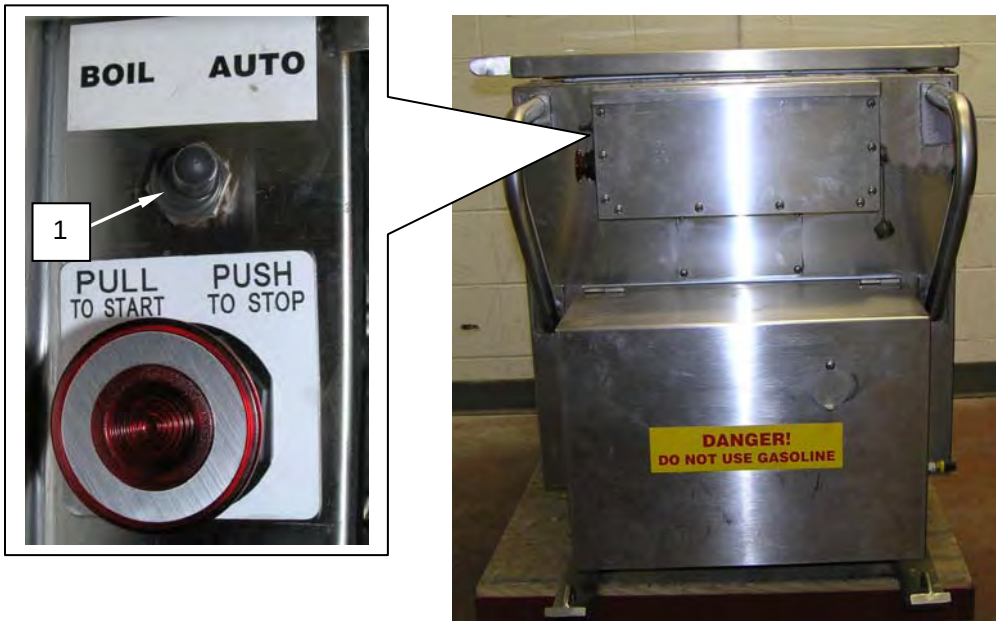


Figure 9. TRH Tank Toggle Switch.

TROUBLESHOOTING PROCEDURE - CONTINUED

MALFUNCTION

TRH tank lid is damaged or improperly aligned.

CORRECTIVE ACTION

STEP 1. Adjust TRH tank lid latches (WP 0022).

STEP 2. At this point in the troubleshooting process, the operator has completed the checks that they are authorized to perform. Refer TRH Tank to service maintenance to continue troubleshooting.

WARNING

Do not attempt to connect a fuel line to the TRH in the vicinity of any open flame. Ensure that the fuel hose connections are made properly to avoid fuel spillage. Prevent a possible fire hazard by having absorbent materials or fuel mats on hand to absorb any spillage. Failure to observe safety precautions may result in injury or death to personnel.

SYMPTOM

TRH Burner emits smoke.

MALFUNCTION

Incorrect TRH burner settings or residual fuel in TRH burner flame tube cause the TRH Burner to emit excess smoke out of the TRH Tank.

CORRECTIVE ACTION

STEP 1. Remove TRH Burner cover and ensure fuel and air settings on burner are set properly (M on fuel control knob and 10 on air control knob). Adjust fuel and air control settings as necessary and wait 10 minutes. If problem persists, proceed to the next step.

STEP 2. Remove TRH Burner from TRH Tank (WP 0026) but do not drain fuel.

STEP 3. Ensure TRH Burner flame tube is clean of fuel. If fuel is present, clean with a rag or cloth.

STEP 4. Replace TRH Burner in TRH Tank (WP 0026).

STEP 5. At this point in the troubleshooting process, the operator has completed the checks that they are authorized to perform. Replace TRH Burner with spare from maintenance kit IAW WP 0026 and refer TRH Burner to service maintenance to continue troubleshooting.

TROUBLESHOOTING PROCEDURE - CONTINUED

SYMPTOM

TRH Burner motor makes scraping noise.

MALFUNCTION

Damage, obstructions, or improper installation has caused the TRH burner motor to scrape against the TRH burner.

CORRECTIVE ACTION

STEP 1. Observe TRH Burner upper fan housing (Figure 10, Item 1) for obstructions that would impede the operations of the motor blower. Remove any obstructions if possible.

Figure 10. TRH Burner Upper Fan Housing.

STEP 2. At this point in the troubleshooting process, the operator has completed the checks that they are authorized to perform. Replace TRH Burner with spare from maintenance kit IAW WP 0026 and refer TRH Burner to service maintenance to continue troubleshooting.

END OF WORK PACKAGE

CHAPTER 5

SERVICE TROUBLESHOOTING PROCEDURES FOR ASSAULT KITCHEN

SERVICE MAINTENANCE

TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Tools and Special Tools

Maintenance Kit (WP 0066, Item 1)
Tool Kit (WP 0066, Item 3)

Personnel Required

Quartermaster Equipment Repairer 63J (1)
Food Service Technician 3381 (1)

Materials/Parts

Oil and Water Absorbent Material (WP 0065, Item 1)
Chemical and Oil Protective Gloves (WP 0065, Item 9)
Industrial Goggles (WP 0065, Item 10)
Wiping Rag (WP 0065, Item 13)
Insulated Wire

References

WP 0010, WP 0012, WP 0022, WP 0026, WP 0031, WP 0033, WP 0037, WP 0038, WP 0039, WP 0043, WP 0049, FM 21-11

TROUBLESHOOTING PROCEDURE

TRAY RATION HEATER (TRH)

To Troubleshoot the TRH, the service maintainer shall perform the operator troubleshooting checks described in WP 0010 to eliminate any malfunctions that the operator may have missed. After verifying that the operator troubleshooting checks have been correctly performed, move on to the service maintenance troubleshooting checks. Prior to replacing components it is recommended that continuity checks be performed to verify serviceability.

WARNING

HIGH VOLTAGE is used in the operation of this equipment. **DEATH ON CONTACT** may result if personnel fail to observe safety precautions. Never work on electrical equipment unless there is at least one other person nearby who is familiar with the operation and hazards of the equipment. That person should also be competent in giving first aid. Ask maintenance personnel about any hazardous features of the TRH prior to doing any maintenance. Whenever possible, external power must be shut off before performing any maintenance. Be careful not to contact high-voltage connections when removing, installing or operating this equipment. Whenever possible, keep one hand away from the equipment to reduce the hazard of current flowing through vital organs of the body. Voltages as low as 50 volts may cause death.

For artificial respiration, refer to FM 21-11.

Do not stand in water while handling live power cords or electrical shock may result. Position all power cables so that they are out of the way during operation and are not in water.

TROUBLESHOOTING PROCEDURE - CONTINUED

SYMPTOM

With Pull-ON/Push-OFF knob in the ON position and the TRH Pull-ON/Push-OFF indicator light not lit, nothing happens.

MALFUNCTION

TRH Tank malfunctions have disabled electrical power delivery to the TRH Burner.

CORRECTIVE ACTION

STEP 1. Verify that the problem is with the TRH tank electronics.

a. To determine which component is malfunctioning, replace the burner control box with the diagnostic test box.

(1) Remove the TRH burner control box from TRH burner (Figure 1, Item 1).

(2) Install diagnostic test box (Figure 1, Item 2) on burner and secure using the integral screw (Figure 1, Item 3).

(3) Pull TRH tank red Pull-ON/Push-OFF knob to ON position.

(4) If amber colored LINE light (Figure 1, Item 4) on diagnostic test box is lit, the TRH tank electronics are working properly and the malfunction exists in the TRH burner. Bench test TRH Burner (WP 0012).

(5) If amber colored LINE light (Figure 1, Item 4) on test box is not lit, the malfunction exists in the TRH tank electronics. Proceed to STEP 2.

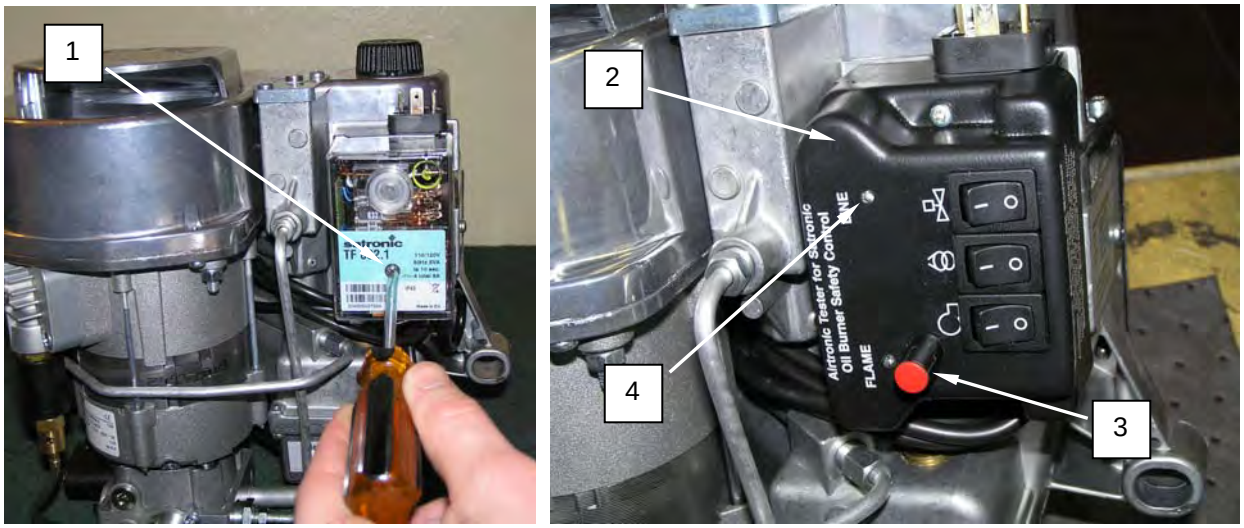


Figure 1. Replacing Electrical Control Box With Diagnostic Test Box.

TROUBLESHOOTING PROCEDURE - CONTINUED

STEP 2. Fabricate a jumper wire by cutting a piece of insulated wire (Figure 2, Item 1) 8 inches in length and strip 1/4-inch of insulation from both ends.

STEP 3. To check electrical components the TRH burner must be installed and connected IAW WP 0026 for troubleshooting on the vehicle or connected to local power if troubleshooting is performed off the vehicle. Verify the red Pull-ON/Push-OFF switch is in the ON position. Verify the TRH tank is filled with enough water below 150°F so that the low water sensor is completely covered.

a. Remove TRH electronic control box cover by removing and retaining cover attachment screws.

STEP 4. Touch one end of the test wire (Figure 2, Item 1) to terminal no. 2 of the terminal strip (Figure 2, Item 2), and touch the other end of the test wire to terminal no. 3 of the terminal strip (Figure 2, Item 2).

a. If the amber colored LINE light on diagnostic test box illuminates, indicating proper burner operation, replace the circuit breaker (WP 0033).

STEP 5. Touch one end of the test wire (Figure 2, Item 1) to terminal no. 2 of the terminal strip (Figure 2, Item 2), and touch the other end of the test wire to terminal no. 4 of the terminal strip (Figure 2, Item 2).

a. If the amber colored LINE light on the diagnostic test box illuminates, indicating proper burner operation, replace the red Pull-ON/Push-OFF switch (WP 0032).

STEP 6. Touch one end of the test wire (Figure 2, Item 1) to terminal no. 2 of the terminal strip (Figure 2, Item 2), and touch the other end of the test wire to terminal no. 5 of the terminal strip (Figure 2, Item 2).

a. If the amber colored LINE light on the diagnostic test box illuminates, indicating proper burner operation, replace the tank tilt switch (WP 0038).

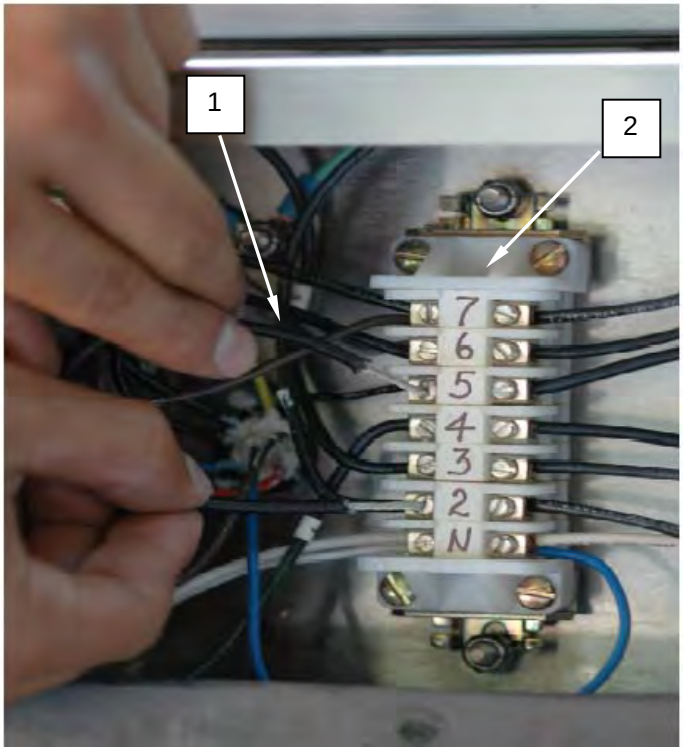


Figure 2. TRH Tank Terminal Strip.

TROUBLESHOOTING PROCEDURE - CONTINUED

STEP 7. Touch one end of the test wire (Figure 3, Item 1) to terminal no. 2 of the terminal strip (Figure 3, Item 2), and touch the other end of the test wire to terminal no. 6 of the terminal strip (Figure 3, Item 2).

a. If the amber colored LINE light on the diagnostic test box illuminates, indicating proper burner operation, replace the Martron probe sensor (WP 0037).

STEP 8. Touch one end of the test wire (Figure 3, Item 1) to terminal no. 2 of the terminal strip (Figure 3, Item 2), and touch the other end of the test wire to terminal no. 7 of the terminal strip (Figure 3, Item 2).

a. If the amber colored LINE light illuminates, indicating proper burner operation, replace the thermal resistor (WP 0039).

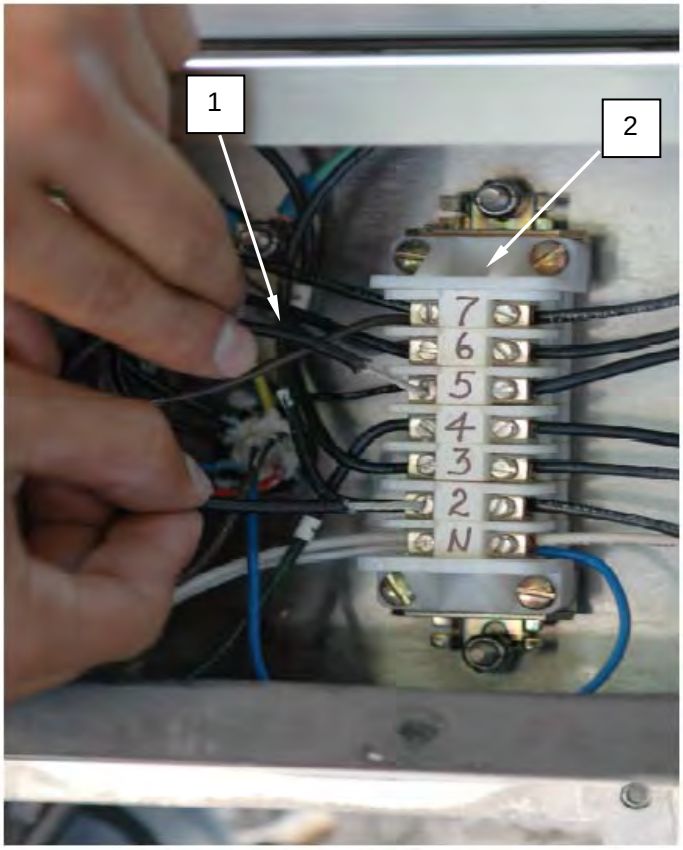


Figure 3. TRH Tank Terminal Strip.

TROUBLESHOOTING PROCEDURE - CONTINUED

STEP 9. Test the thermodisc as follows:

a. Disconnect power to the TRH tank.

b. Disconnect the black thermodisc wire on left side of terminal no. 7 on terminal block (Figure 4, Item 2).

c. Reconnect power to the TRH tank.

d. Ensure TRH red Pull-ON/Push-OFF is in the ON position.

WARNING

Never use the “BOIL” mode to prepare rations as it bypasses built in safety features and may cause personnel to be burned by vented steam or scalding can contents. Never leave the TRH unattended when operating in the “BOIL” mode. Water may ”boil over” causing injury to personnel.

e. Ensure AUTO/BOIL switch is in the BOIL position.

f. If the burner does not operate touch one end of the test wire (Figure 4, Item 1) to terminal no. 2 of the terminal strip (Figure 4, Item 2), and touch the other end of the test wire to terminal no. 7 of the terminal strip (Figure 4, Item 2).

g. If the amber colored LINE light illuminates, indicating proper burner operation, replace the AUTO/BOIL switch (WP 0031).

h. Reconnect the black thermodisc wire on left side of terminal no. 7 on terminal block.

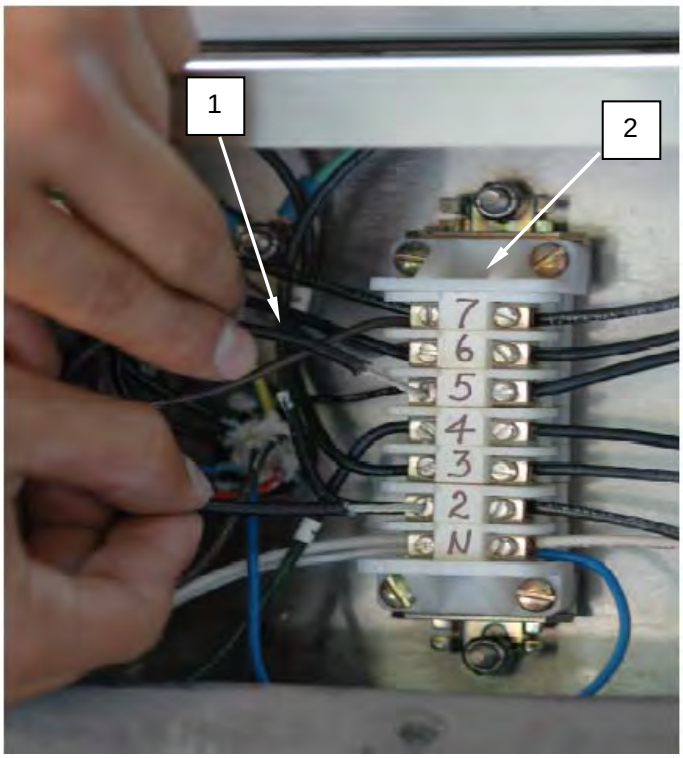


Figure 4. TRH Tank Terminal Strip.

TROUBLESHOOTING PROCEDURE - CONTINUED

i. If troubleshooting up to this point does not correct the fault, check for broken wires, bad grounds, or bad components.

j. Replace desiccant bag and primary control box cover and retain cover with screws.

WARNING

Do not attempt to connect a fuel line to the TRH in the vicinity of any open flame. Ensure that the fuel hose connections are made properly to avoid fuel spillage. Prevent a possible fire hazard by having absorbent materials or fuel mats on hand to absorb any spillage. Failure to observe safety precautions may result in injury or death to personnel.

SYMPTOM

With Pull-ON/Push-OFF knob in the ON position, TRH attempts to start but does not or TRH is running normally and then stops.

MALFUNCTION

Fuel flow problems have stopped the TRH during operation or have prevented the TRH from starting properly.

STEP 1. Ensure air control system is working properly.

a. Perform motor and air compressor test IAW WP 0012.

STEP 2. Ensure fuel control solenoid and fuel pump are working properly.

a. Perform fuel pump and priming test IAW WP 0012.

b. Perform fuel pump gauge test IAW WP 0012.

STEP 3. Ensure air compressor is working properly.

a. Perform air compressor gauge test IAW WP 0012.

TROUBLESHOOTING PROCEDURE - CONTINUED

SYMPTOM

TRH Burner does not install in TRH Tank.

MALFUNCTION

The TRH Tank is damaged so that TRH Burner will not fit in burner housing.

CORRECTIVE ACTION

STEP 1. Check the alignment of the TRH Tank saddle pins (Figure 5, Item 1) located inside the TRH Tank burner housing. Align saddle pins so that TRH Burner can slide into TRH Tank burner housing.

Figure 5. Saddle Pin Locations.

STEP 2. Check TRH Tank burner housing for damage.

a. If TRH Tank burner housing is bent or dented, repair damage using shop equipment so that TRH Burner is able to be installed in TRH Tank.

TROUBLESHOOTING PROCEDURE - CONTINUED

MALFUNCTION

The TRH Burner was improperly assembled or damaged so that it will not fit in the TRH tank or will not assemble properly.

CORRECTIVE ACTION

STEP 1. Check TRH burner for proper assembly or damage

a. Disassemble burner IAW WP 0043 and observe components for damage.

(1) Replace any burner components that are damaged or unable to be properly installed.

b. Reassemble burner IAW WP 0043 and test fire IAW test firing procedures in WP 0012.

WARNING

Do not attempt to connect a fuel line to the TRH in the vicinity of any open flame. Ensure that the fuel hose connections are made properly to avoid fuel spillage. Prevent a possible fire hazard by having absorbent materials or fuel mats on hand to absorb any spillage. Failure to observe safety precautions may result in injury or death to personnel.

SYMPTOM

Fuel has leaked out of the system.

MALFUNCTION

Fuel has leaked out of the system.

CORRECTIVE ACTION

STEP 1. Check fuel sump.

a. Check fuel sump retaining screws (Figure 6, Item 1) for tightness.

(1) Tighten any loose fuel sump retaining screws (Figure 6, Item 1).

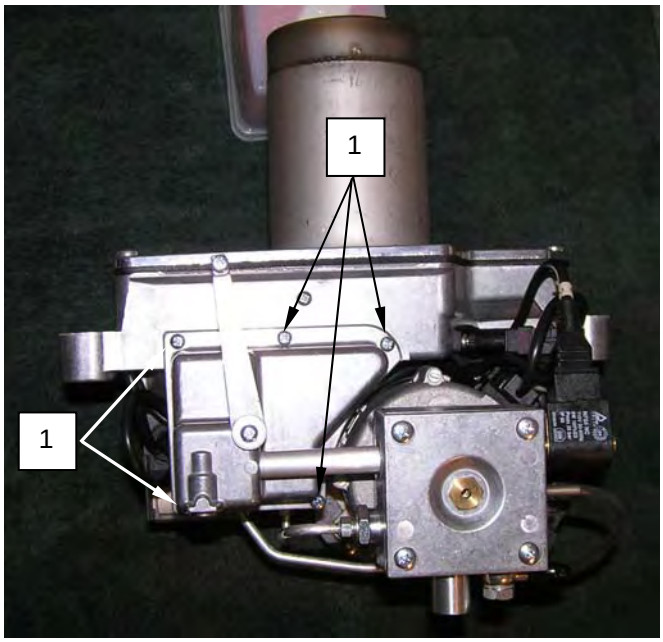


Figure 6. Fuel Sump Retaining Screws.

TROUBLESHOOTING PROCEDURE - CONTINUED

b. Check drain plug (Figure 7, Item 1) for proper installation.

(1) Tighten drain plug (Figure 7, Item 1).

Figure 7. Fuel Sump Drain Plug.

TROUBLESHOOTING PROCEDURE - CONTINUED

c. Check fuel sump gasket (Figure 8, Item 1) for damage or improper installation.

(1) Loosen fuel sump retaining screws (Figure 8, Item 2) and remove fuel sump.

(2) Realign fuel pump gasket (Figure 8, Item 1) so that it rests in the alignment groove. Replace the fuel sump gasket if it is damaged (Figure 8, Item 1).

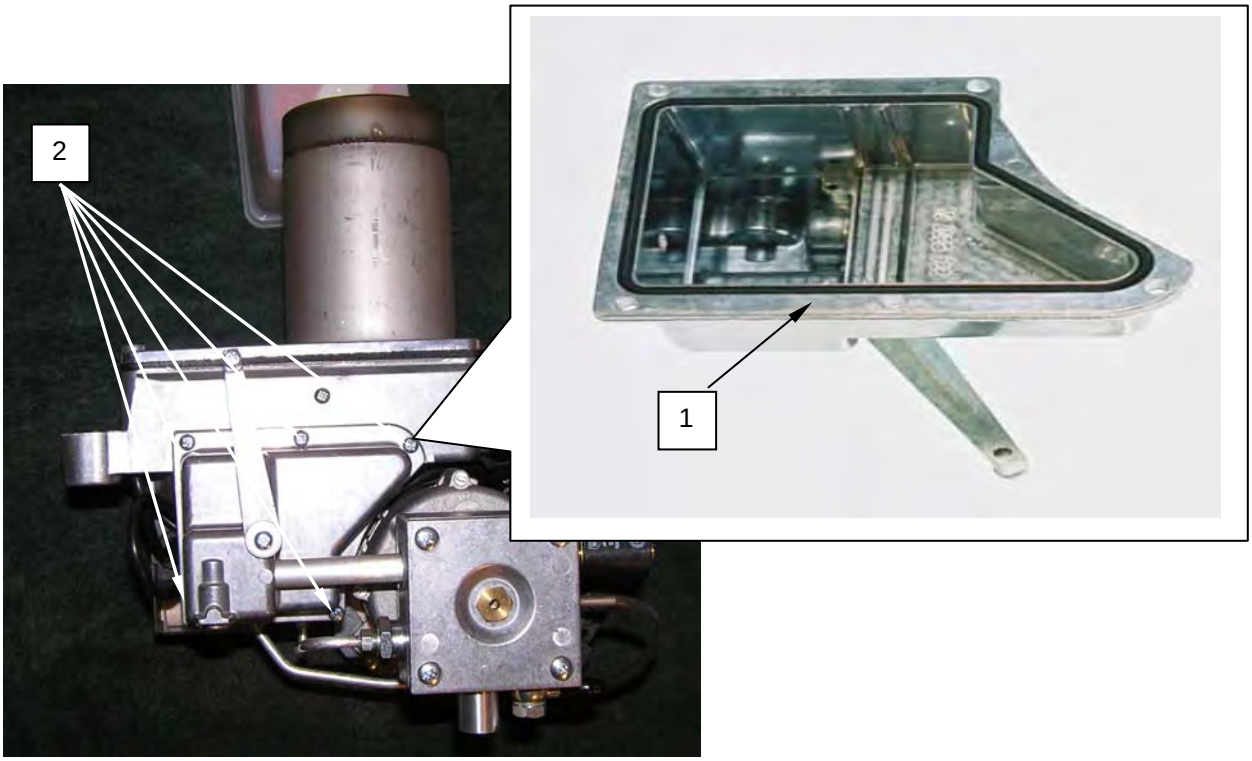


Figure 8. Fuel Sump Gasket.

TROUBLESHOOTING PROCEDURE - CONTINUED

STEP 2. Check flow control module cover .

a. Check flow control module cover gasket (Figure 9, Item 1) for damage or improper installation.

(1) Loosen flow control module cover retaining screws (Figure 9, Item 2) and remove flow control module cover.

(2) Realign flow control module cover gasket (Figure 9, Item 1) so that it rests in the alignment groove. Replace the flow control module cover gasket (Figure 9, Item 1) if it is damaged.

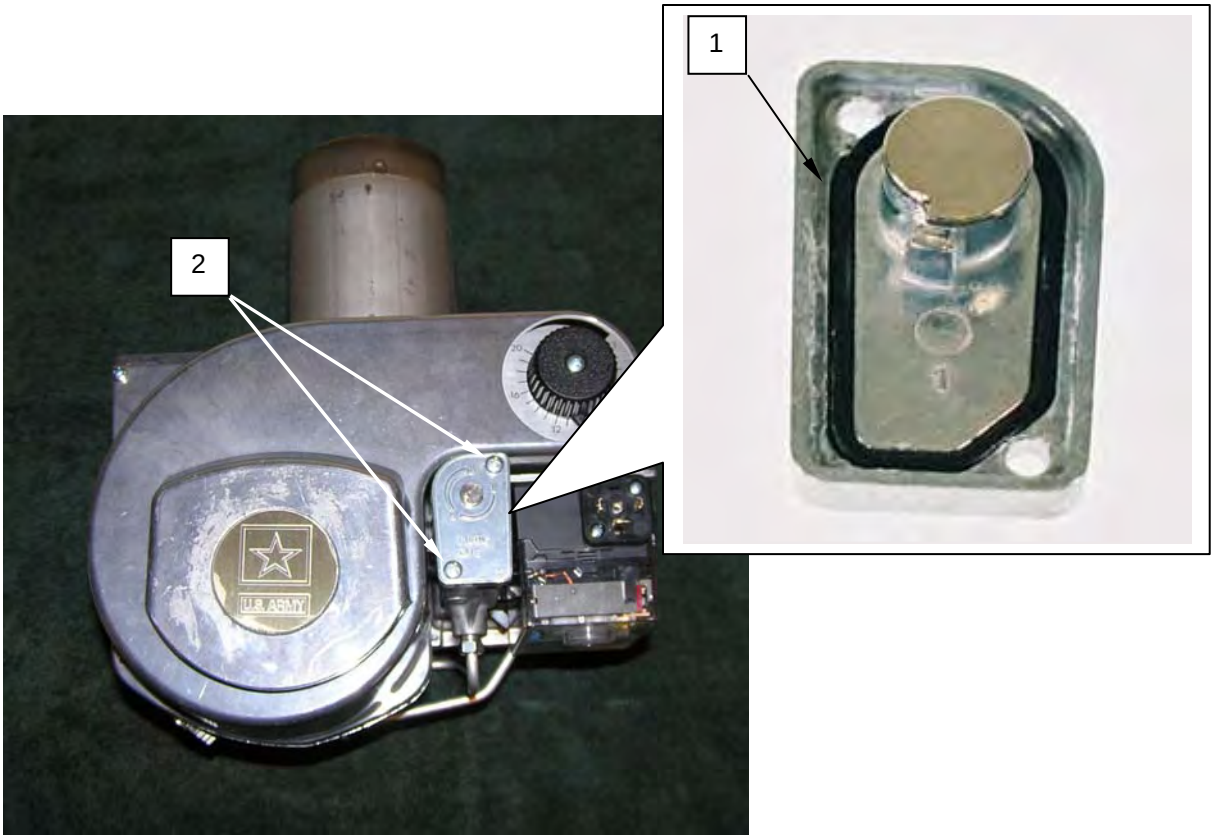


Figure 9. Flow Control Module Cover Gasket.

TROUBLESHOOTING PROCEDURE - CONTINUED

STEP 3. Check crossover tube (Figure 10, Item 1).

a. Loosen fuel sump retaining screws (Figure 10, Item 2) and remove fuel sump.

b. Remove crossover tube by gently pulling away from fuel pump.

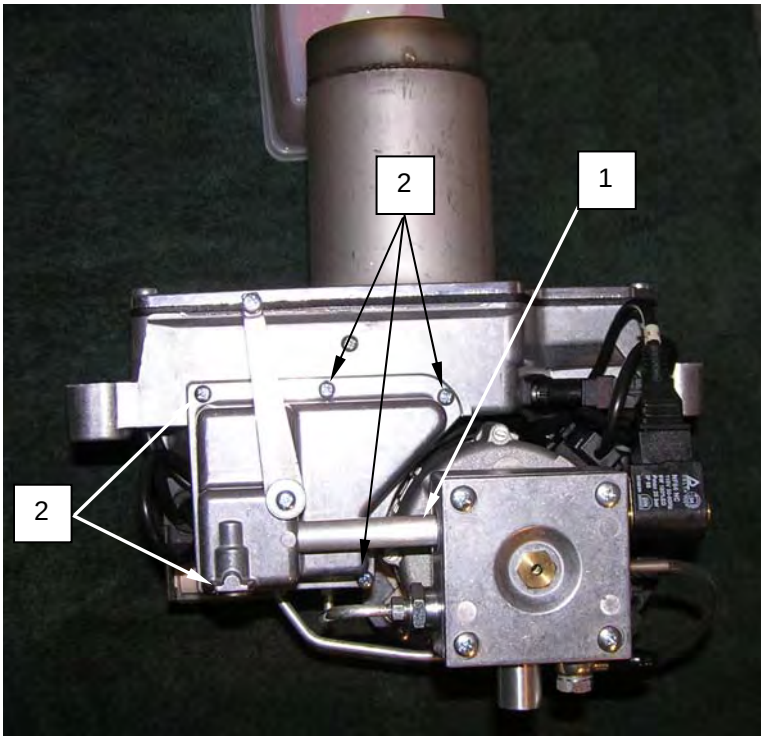


Figure 10. Removing the Crossover Tube.

c. Check crossover tube O-rings (Figure 11, Item 1) for damage or improper installation.

(1) Realign crossover tube O-rings (Figure 11, Item 1) so they fit properly.

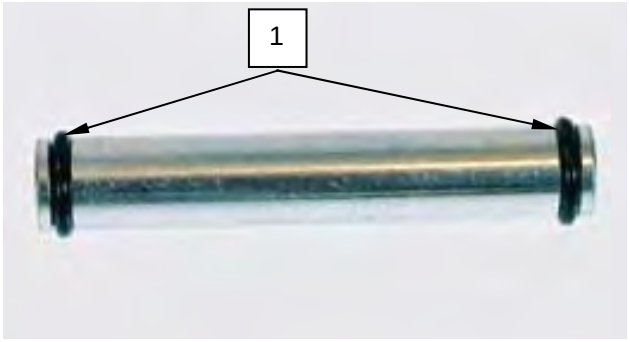


Figure 11. Crossover Tube O-rings.

TROUBLESHOOTING PROCEDURE - CONTINUED

STEP 4. Check atomizing chamber (Figure 12, Item 1).

a. Loosen five screws retaining front flange to burner housing and remove front flange (Figure 12, Item 2).

b. Remove atomizing chamber (Figure 12, Item 1) by pulling firmly away from burner housing

c. Check status of gasket (Figure 12, Item 3) located on back side of atomizing chamber (Figure 12, Item 1).

(1) Replace any damaged or unserviceable atomizing chamber gasket (Figure 12, Item 3).

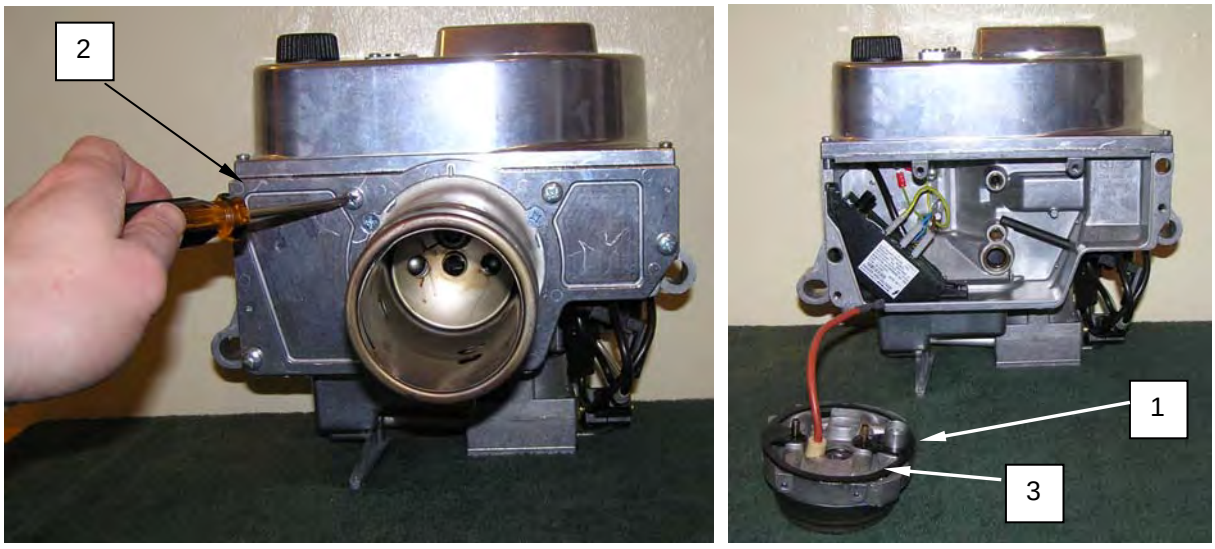


Figure 12. Removing TRH Burner Front Flange.

SYMPTOM

Excess steam when TRH lid is closed.

MALFUNCTION

TRH is set to incorrect mode of operation.

CORRECTIVE ACTION

STEP 1. Ensure TRH Tank lid gasket is not damaged, rotted, or deformed. Repair the TRH Tank Lid by replacing an unserviceable lid gasket (WP 0049).

STEP 2. Replace TRH Tank lid (WP 0022).

TROUBLESHOOTING PROCEDURE - CONTINUED

SYMPTOM

TRH burner emits smoke and/or sparks.

MALFUNCTION

Incorrect TRH burner settings or residual fuel in TRH burner flame tube have caused the TRH Burner to emit smoke and/or sparks.

CORRECTIVE ACTION

STEP 1. Ensure motor is working properly.

a. Perform motor test IAW WP 0012.

STEP 2. Ensure air control solenoid is working properly.

a. Perform air control system test IAW WP 0012.

STEP 3. Ensure fuel control solenoid is working properly.

a. Perform fuel control solenoid test IAW WP 0012.

STEP 4. Ensure fuel pump is working properly.

a. Perform fuel pump and priming test IAW WP 0012.

b. Perform fuel pump gauge test IAW WP 0012.

STEP 5. Ensure air compressor is working properly.

a. Perform air compressor gauge test IAW WP 0012.

TROUBLESHOOTING PROCEDURE - CONTINUED

SYMPTOM

TRH Burner motor makes scraping noise.

MALFUNCTION

Damage, obstructions, or improper installation has caused the TRH Burner motor to scrap against the TRH burner.

CORRECTIVE ACTION

STEP 1. Disassemble TRH Burner IAW WP 0043.

STEP 2. Check motor and blower wheel for freedom of movement by attempting to rotate motor by hand.

a. If movement is restricted, remove and reinstall blower wheel.

(1) Loosen blower wheel retaining screw (Figure 13, Item 1).

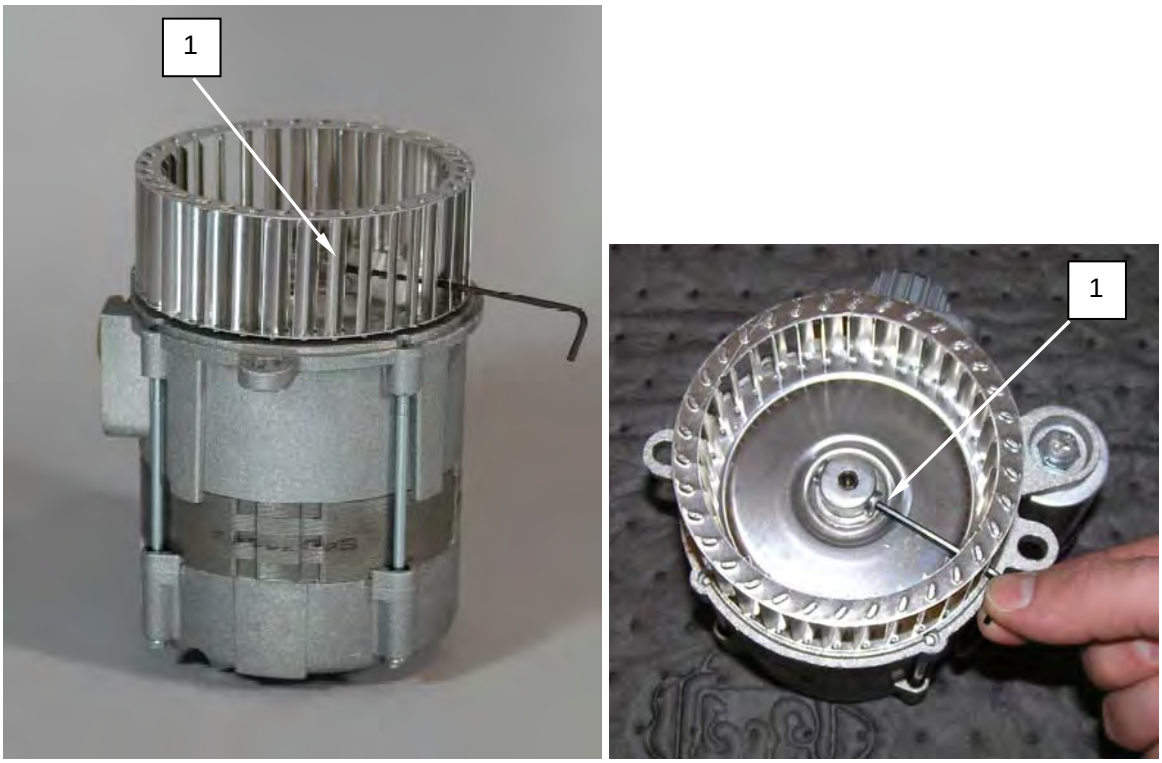


Figure 13. TRH Burner Motor and Blower Wheel.

(2) Align blower wheel to motor and attempt to rotate blower wheel before securing with retaining screw.

i. If blower wheel is able to rotate, retain blower wheel to motor using retaining screw.

ii. If blower wheel is unable to rotate, replace blower wheel and motor IAW WP 0043.

END OF WORK PACKAGE

SERVICE MAINTENANCE

MULTI-FUEL BURNER TEST

INITIAL SETUP:

Tools and Special Tools

Maintenance Kit (WP 0066, Item 1)
Tool Kit (WP 0066, Item 3)

Personnel Required

Quartermaster Equipment Repairer 63J (1)
Food Service Technician 3381 (1)

Materials/Parts

Oil and Water Absorbent Material (WP 0065, Item 1)
Chemical and Oil Protective Gloves (WP 0065, Item 9)
Industrial Goggles (WP 0065, Item 10)
Wiping Rag (WP 0065, Item 13)

Equipment Condition

Burner removed from TRH (WP 0026)

References

WP 0010	WP 0019	WP 0020
WP 0031	WP 0032	WP 0043
WP 0045	WP 0046	WP 0047

TEST

To properly test the burner assembly on a bench, refer to the Setup Procedure paragraph below. After proper setup of the workbench has been completed, follow the steps in the appropriate section of this work package.

WARNING

During operation, the TRH burner produces harmful carbon monoxide (CO) and other gases. Carbon monoxide is a colorless, odorless, and tasteless gas. Mild cases of carbon monoxide poisoning can cause symptoms such as nausea, dizziness or headaches. Severe cases of carbon monoxide poisoning can result in brain damage, heart damage or death. Remember that although CO has no telltale odor, it may mix with other odors that mask its presence; therefore, CO can be present within a mix of seemingly harmless odors. To prevent CO poisoning, ensure that the operating spaces are well ventilated during burner operation.

WARNING

The burner assembly flame tube is exposed during bench testing. Flames will shoot out of flame tube opening during operation. Special care is required to keep area around flame tube opening clear of personnel and equipment.

TEST - CONTINUED

Setup Procedure

The items in Table 1 below are required for testing the burner on a workbench.

Table 1. Bench Testing Materials.

Item	Source	Item	Source
Folding Table	AK	Absorbent Material	Local Use
Fire Extinguisher	AK or Local Use	TRH Burner	AK
Fuel Can With Adapter	AK or Local Use	Wiping Rags	Local Use
Fuel Line	AK	Fuel Drainage Container	Local Use
Power Test Cord	TRH Spare Parts Kit	Power Strip	Local Use
Test Control Box	TRH Spare Parts Kit	TRH Spare Parts Kit	AK
Metal Dust Pan	Local Use		

Use the following steps to set up the workbench:

1. Set up the folding table and place the burner to be tested on a fuel absorbent mat on the table.

2. Remove the electrical control box from burner (Figure 1, Item 1).

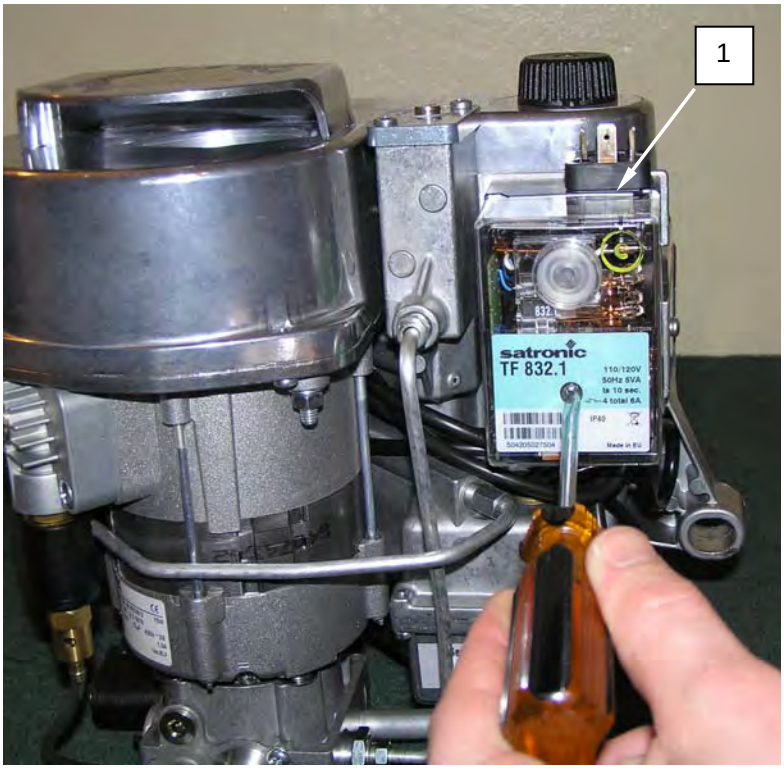


Figure 1. Electrical Control Box Removal.

TEST - CONTINUED

WARNING

When using the diagnostic test box to test the TRH Burner, be careful to observe the condition of the test switches on the test box. All switches shall be in the OFF (O) position. Failure to observe this warning may cause unexpected TRH Burner start-up resulting in injury or death to personnel.

3. Install test control box (Figure 2, Item 1) on burner and secure using the integral screw (Figure 2, Item 2).

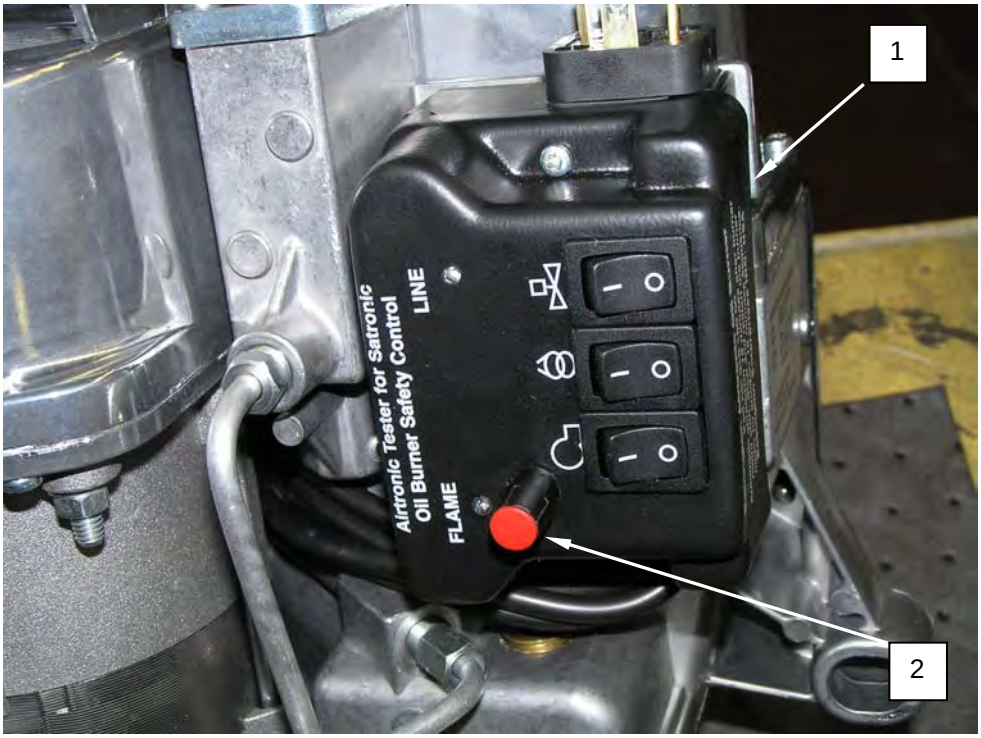


Figure 2. Test Control Box Placement.

WARNING

Gasoline should **NOT** be used with the TRH under any circumstance. **Only JP-8 or an approved alternate diesel fuel may be used.** Using gasoline in the TRH will create a fire danger and potential for explosion. Failure to observe safety precautions may result in injury or death to personnel.

4. Attach fuel can adapter to a 5-gallon fuel can.

5. Remove the hose clamp from the opposite end of the fuel line.

TEST – CONTINUED

6. Attach fuel line from can adapter (Figure 3, Item 1) to burner fuel input (Figure 3, Item 2).

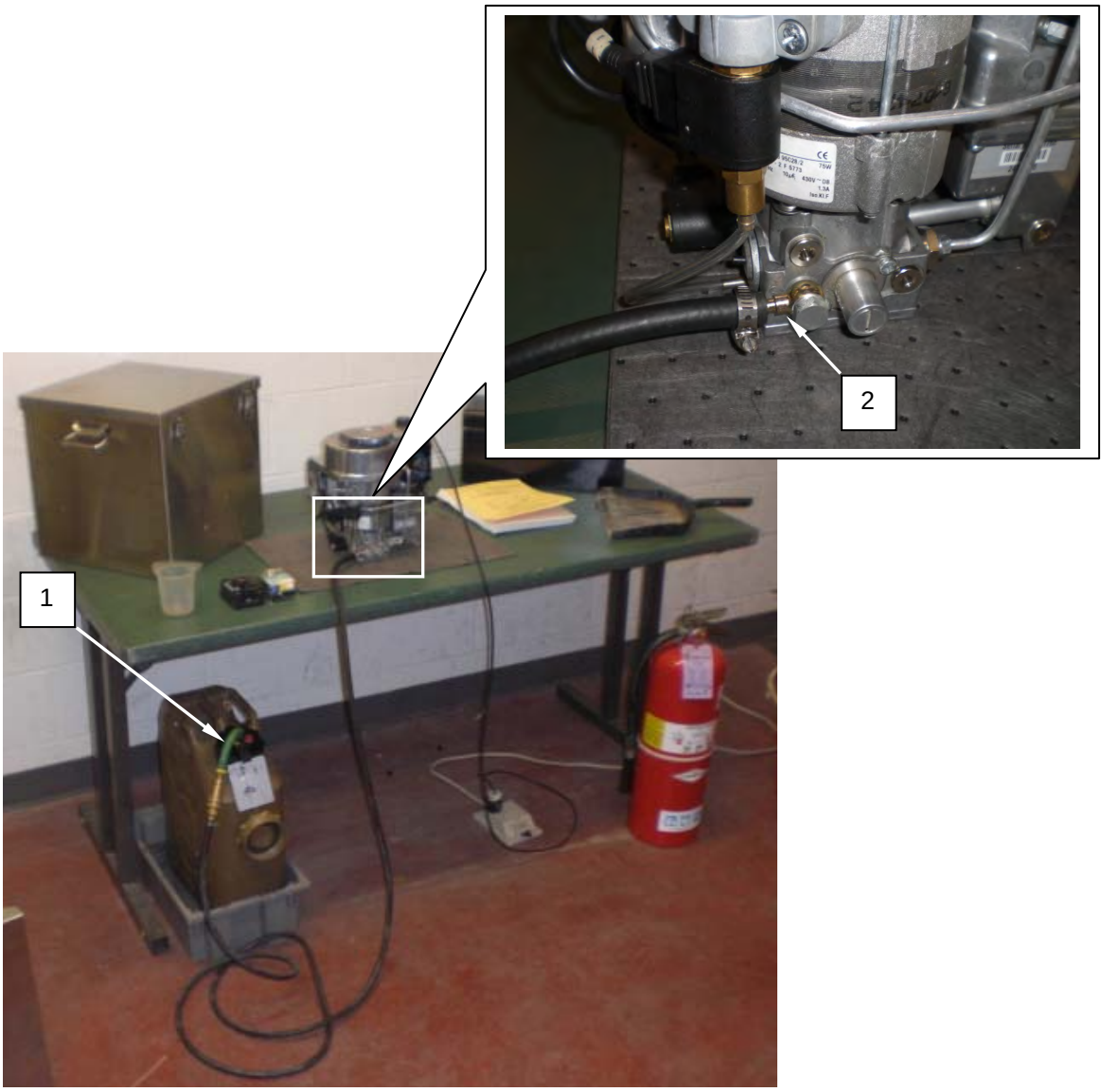


Figure 3. Typical Bench Testing Setup.

WARNING

When using the diagnostic test box to test the TRH Burner, be careful to observe the condition of the test switches on the test box. All switches shall be in the OFF (O) position. Failure to observe this warning may cause unexpected TRH Burner start-up resulting in injury or death to personnel.

7. Connect power test cord to burner control box input and power strip 110 VAC outlet.

8. Connect power strip to 110 VAC outlet.

9. The Burner Assembly is now ready for bench testing.

END OF TASK

TEST – CONTINUED

Power Flow Test

TRH Burner power flow may be interrupted by improper power connections or damaged components. Verify proper power flow to TRH Burner by performing the following checks:

1. Observe the status of the amber colored LINE light (Figure 4, Item 1) on the diagnostic test box (Figure 4, Item 2).

2. If amber LINE light (Figure 4, Item 1) is lit, the TRH Burner is receiving power properly and no further action is required.

3. If amber colored LINE light (Figure 4, Item 1) is not lit perform the following checks:

   a. Check the power source.

      (1) Ensure power strip is turned ON and the power strip circuit breaker reset is not tripped. Refer to power strip operating instructions for assistance.

      (2) Ensure power source is working properly by testing with a meter or a known good 110 VAC device.

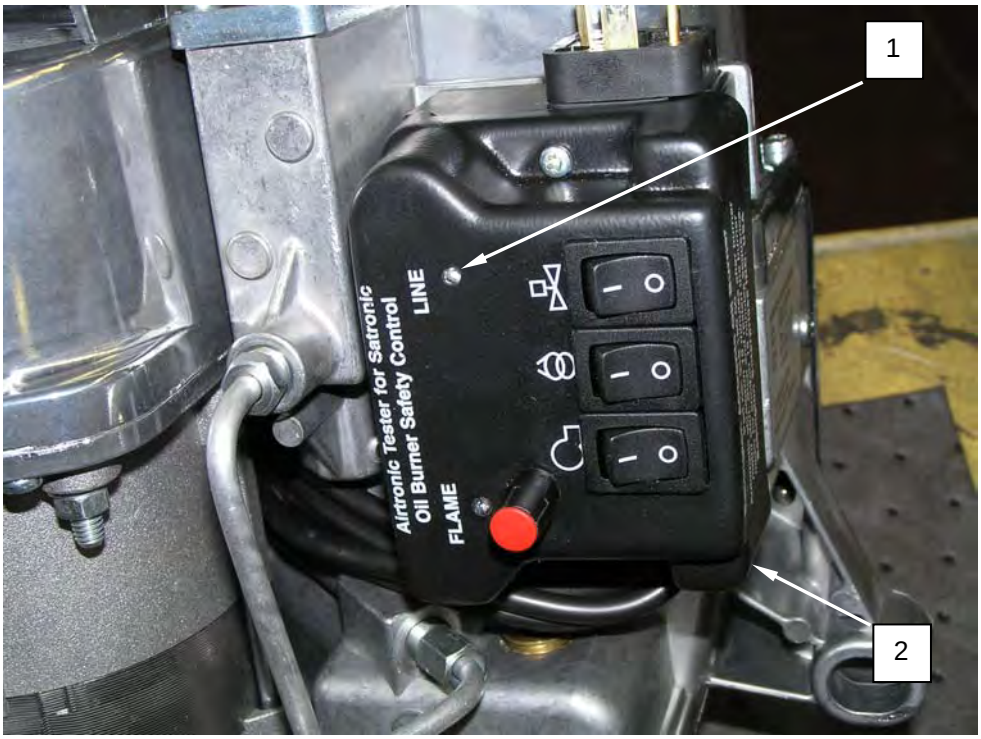


Figure 4. Diagnostic Test Box Status.

   b. If power source is working properly, the diagnostic test box may be malfunctioning. If available, try using a new test box.

   c. If none of the checks listed above illuminates the amber colored LINE light, check the TRH Burner wiring.

END OF TASK

TEST – CONTINUED

Photocell Test

NOTE

A flashlight may be used to perform this test.

The photocell test will ensure proper operation and orientation of the photocell. To test the photocell, refer to the following procedures:

1. Face the front of the burner towards a direct light source; ensuring the flame tube opening (Figure 5, Item 1) is clear and well lit.

2. Place an opaque, non-flammable object over flame tube opening (Figure 5, Item 1) to block light.

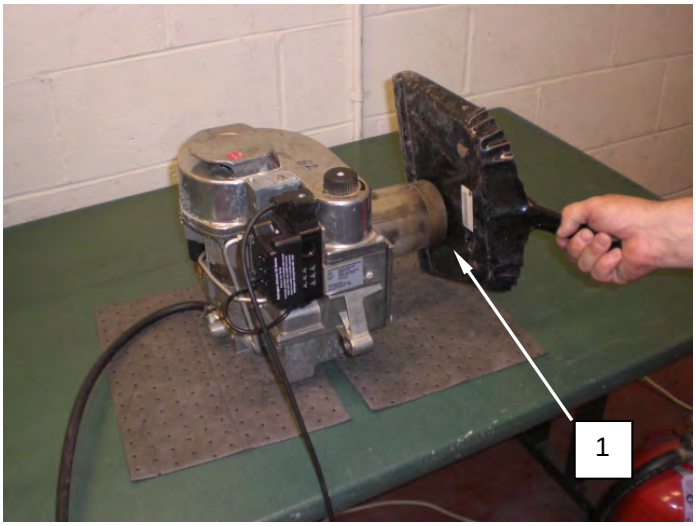


Figure 5. Photocell Test.

3. The amber colored LED on the control test box labeled FLAME (Figure 6, Item 1) should not be lit with flame tube covered.

4. Remove opaque, non-flammable object. FLAME LED (Figure 6, Item 1) should be lit.

Figure 6. Test Control Box.

TEST – CONTINUED

5. If Photocell test fails, check the following:

   a. Check photocell installation. Photocell must be fully inserted in photocell base (Figure 7, Item 1) with photocell collar properly aligned and photocell light detector facing combustion chamber.

      (1) Disconnect power cable from photocell and reinstall power cable to photocell, ensuring proper seating.

      (2) Ensure light detector (Figure 7, Item 2) on photocell is pointing away from the photocell power cable (Figure 7, Item 3).

      (3) Ensure photocell standoff (Figure 7, Item 4) is placed on photocell. Align tab on photocell standoff with notch on photocell.

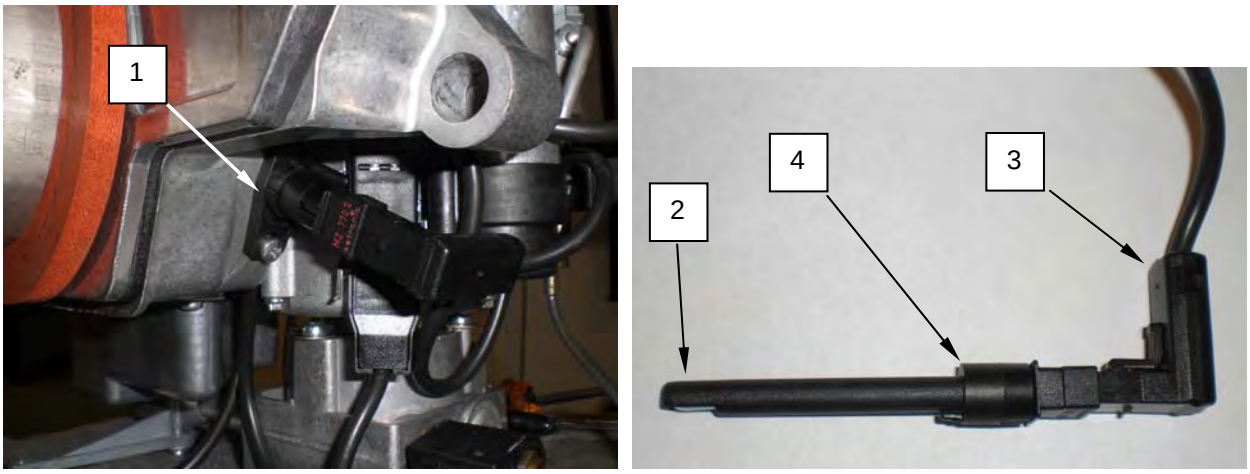


Figure 7. Photocell to Power Cable Connection.

TEST – CONTINUED

(4) Ensure photocell (Figure 8, Item 1) is inserted into TRH burner by sliding into photocell base (Figure 8, Item 2), aligning tab on photocell standoff with notch on photocell base, and orienting so that the top of the photocell is facing the TRH burner flame tube (Figure 8, Item 3) as shown in Figure 8.

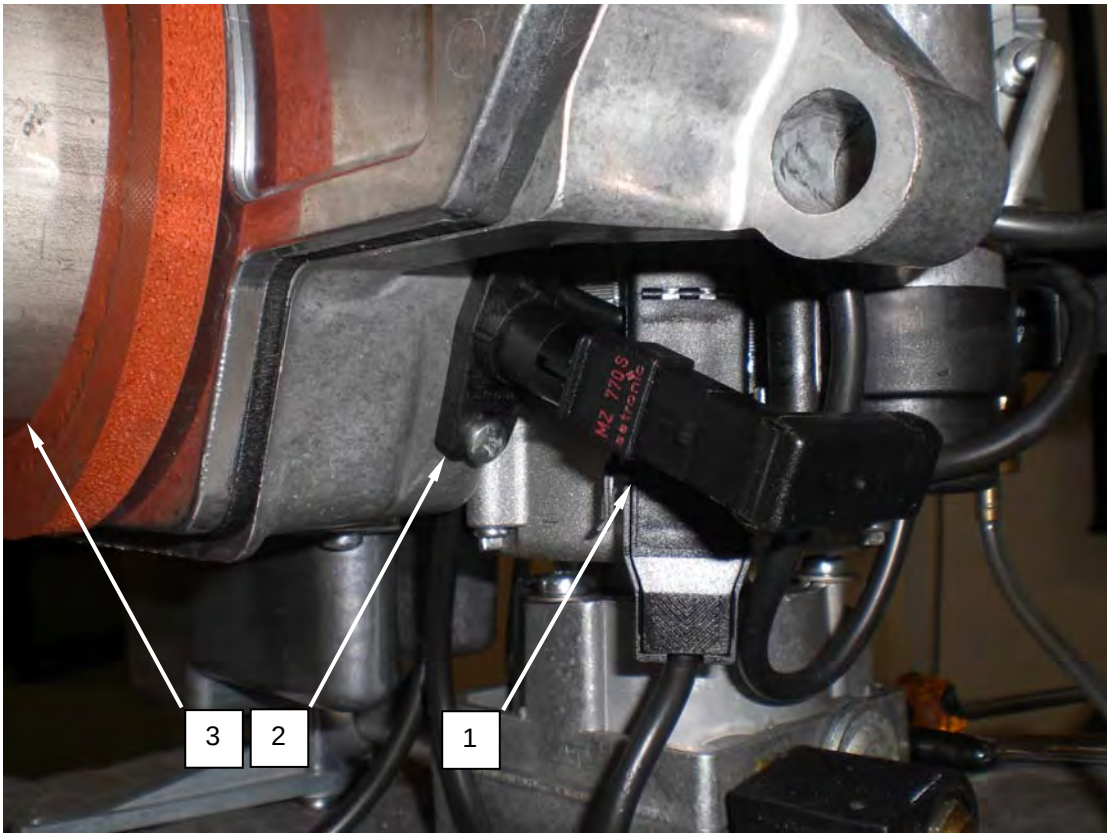


Figure 8. Photocell Orientation.

b. If the following checks do not correct the problem, replace photocell IAW WP 0028.

6. Test fire burner IAW test firing paragraph in this WP.

END OF TASK

TEST – CONTINUED

Motor and Air Compressor Test

The motor test will ensure proper operation of the blower motor. To test the blower motor, refer to the following procedures:

1. Press motor test switch on test control box (Figure 9, Item 1). The blower should start running.

    a. If blower makes strange noises, such as scraping or bumping, turn motor off and refer to WP 0043 for blower motor replacement procedures.

    b. If blower does not start, turn off motor and refer to WP 0043 for blower motor replacement procedures.

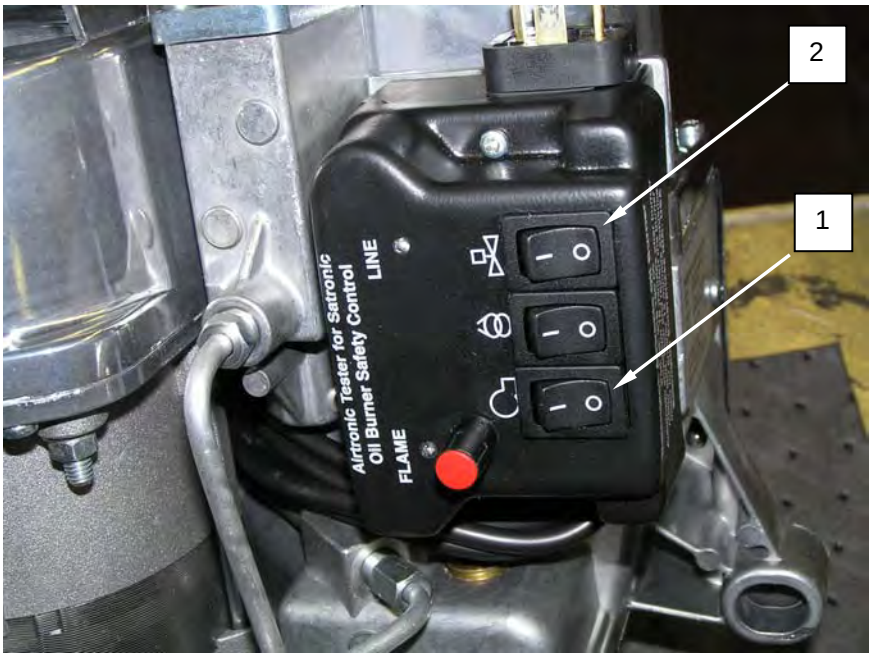


Figure 9. Test Control Box.

TEST – CONTINUED

2. With blower still running, place a finger over the priming port (Figure 10, Item 1). Air should be felt escaping from the priming port.

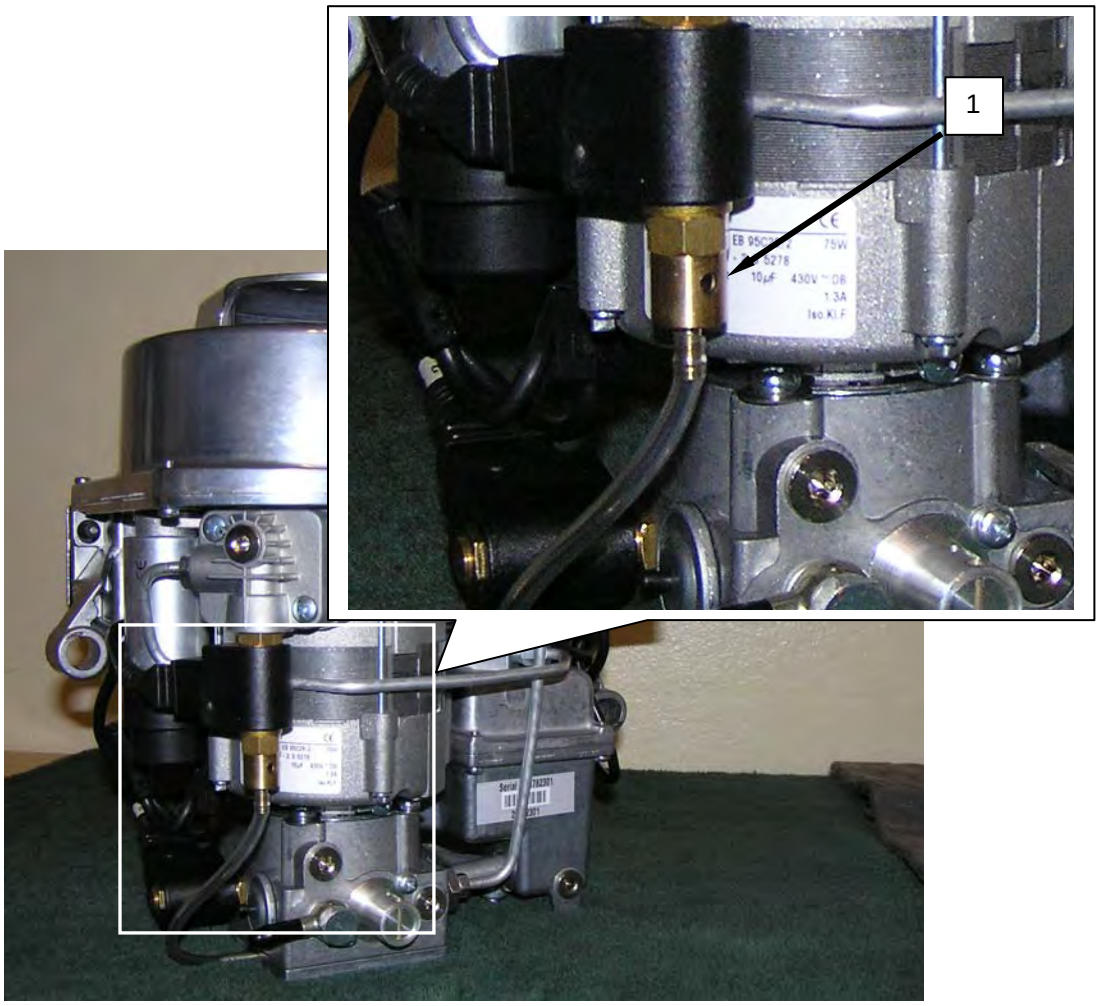


Figure 10. TRH Burner Priming Port.

   a. If no air is felt at the priming port, turn blower off and replace the following components one at a time, in order, until air is felt escaping from the TRH Burner priming port.

      (1) Compressor filter (WP 0019).

      (2) Air Solenoid Valve (WP 0043).

      (3) Compressor Piston Ring and O-Ring (WP 0043).

      (4) Metal Air Line (WP 0043).

      (5) Compressor Head Assembly (WP 0043).

3. With blower still running, continue to feel for air at the priming port and turn on the air solenoid test switch (Figure 9, Item 2). No air should be felt at the priming port.

   a. If air is still felt at the priming port turn off motor test switch and air solenoid test switch and replace air solenoid IAW WP 0043.

TEST – CONTINUED

4. Turn off motor test switch and air solenoid test switch.

5. If corrective action was taken, test fire burner IAW test firing paragraph in this WP.

END OF TASK

Ignition Transformer Test

To test the ignition transformer refer to the following steps:

1. Turn on the motor test switch (Figure 11, Item 1).

2. Turn on the ignition transformer test switch on the test control box (Figure 11, Item 2).

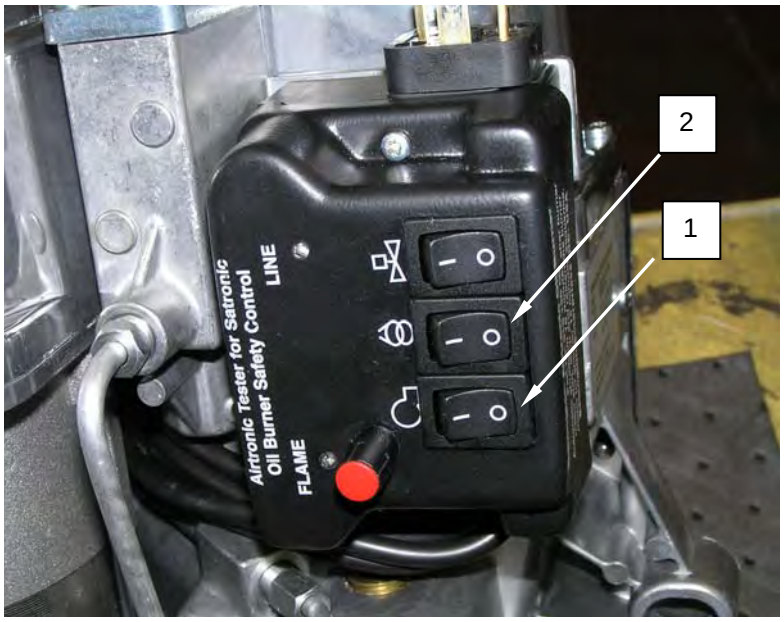


Figure 11. Test Control Box.

3. A clicking or sizzling sound should be heard.

WARNING

During the Ignition Transformer test, it is necessary to look into the TRH Burner flame tube to observe a spark. When observing the flame tube for existence of a spark be sure to stay as far away as possible from the flame tube. Failure to observe this warning may result in injury or death to personnel.

4. Look into the flame tube at the combustion chamber for a blue spark.

   a. If spark is observed, turn off the ignition transformer and motor test switches.

   b. If no sound was heard and no spark was observed, refer to WP 0046 for igniter replacement.

5. If corrective action was taken, test fire burner IAW test firing paragraph in this WP.

END OF TASK

TEST – CONTINUED

Fuel Pump and Priming Test

1. Remove the fuel tower cover (Figure 12, Item 1).

    a. Ensure the fuel tower cover O-ring is properly seated in the groove with no tears, cracks, or deterioration.

    b. Replace O-ring if necessary.

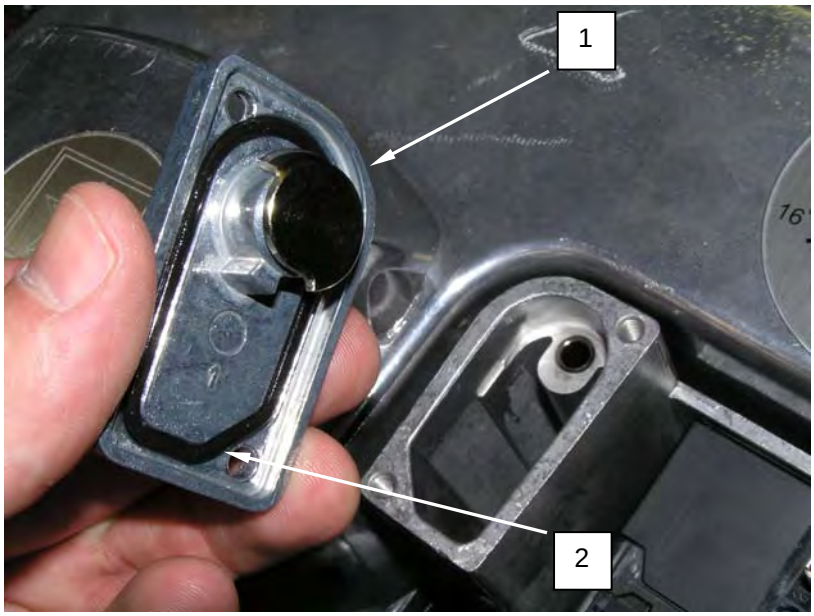


Figure 12. Fuel Tower Cover.

2. To prime the fuel pump, place a thumb over the priming port (Figure 13, Item 1) and depress the stud on the side of the fuel pump (Figure 13, Item 2). Maintain this position while performing next step.

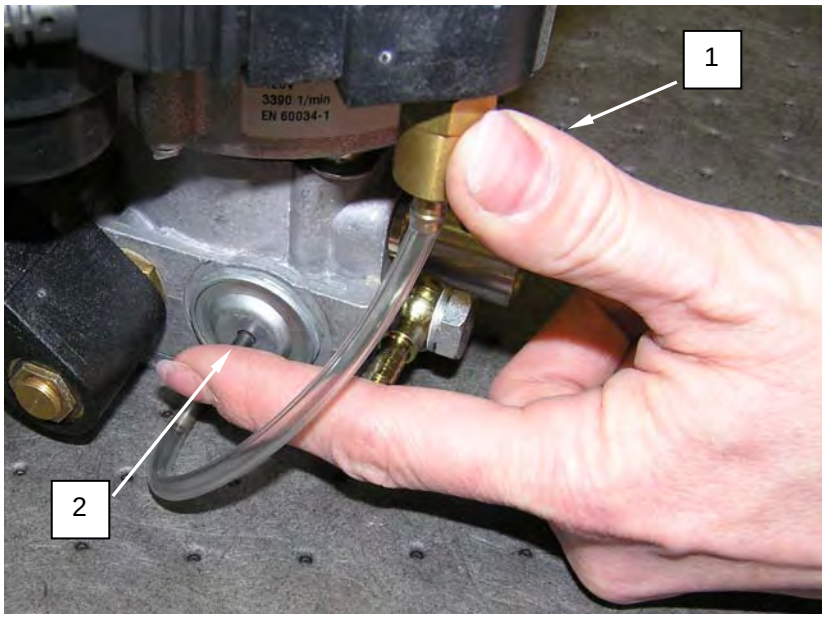


Figure 13. Fuel Pump Priming.

TEST – CONTINUED

WARNING

Fuel in the fuel tower may splatter during priming and purging process. Take care when observing fuel tower to prevent fuel from getting in eyes or mouth. Wear eye protection when performing pump and priming test.

3. While observing the fuel tower (Figure 14, Item 1) turn on the motor test switch (Figure 14, Item 2) and watch for fuel.

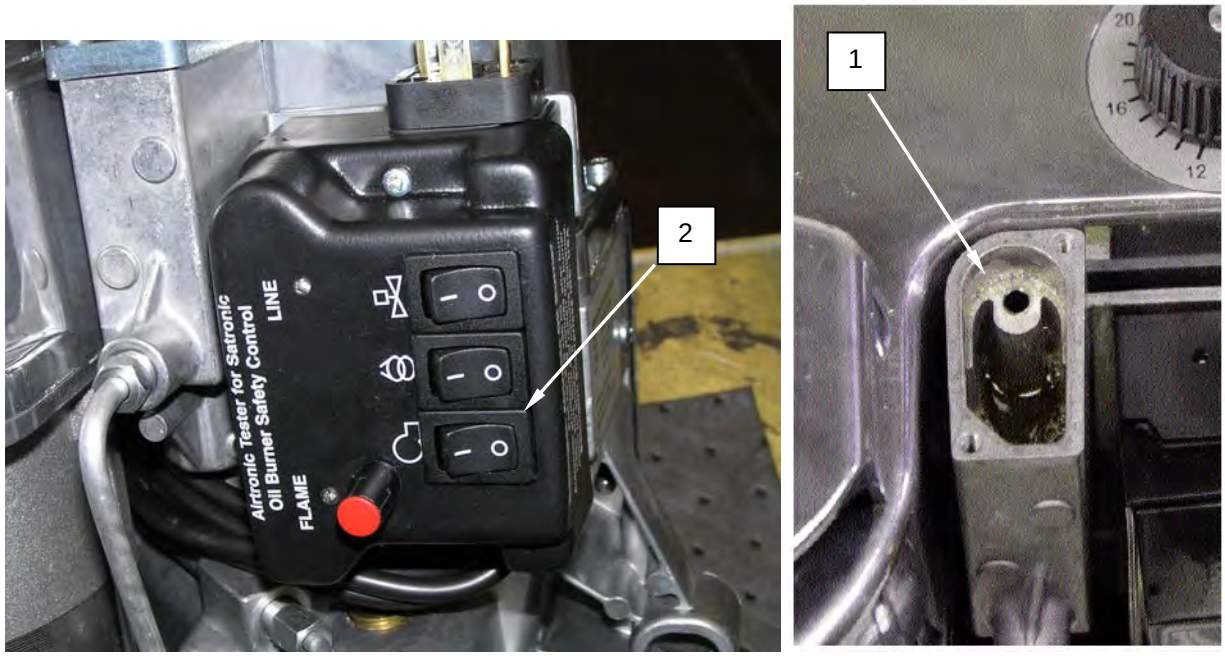


Figure 14. Fuel Tower.

a. The fuel tower will begin to fill with fuel. The fuel may bubble, then foam. This is proper fuel pump operation. If pump functions properly, turn of switches.

b. If no fuel is observed in the fuel tower (improper fuel flow to the burner) turn off switches and check the fuel delivery system as follows:

(1) Ensure TRH Burner metal fuel line is properly connected and not damaged IAW WP 0043.

(2) Ensure fuel pump connector tube is properly installed and not damaged IAW WP 0047.

(3) Ensure fuel control solenoid is properly installed and not damaged IAW WP 0043.

(4) Ensure fuel pump is properly installed and not damaged IAW WP 0045.

4. Ensuring the fuel tower cover O-ring is properly seated, replace the fuel tower cover and the fuel tower cover retaining screws.

TEST - CONTINUED

5. Ensure the fuel control knob (Figure 15, Item 1) is set to “M” for proper burner operation.

Figure 15. Fuel Control Setting.

6. If corrective action was taken, test fire burner IAW test firing paragraph in this WP.

END OF TASK

TEST - CONTINUED

Air Compressor Gauge Testing

1. Remove plug fitting (Figure 16, Item 2) from compressor head.

2. Install the compressor pressure gauge (Figure 16, Item 2) in the head of the compressor and screw in compressor pressure gauge with a wrench, about two turns.

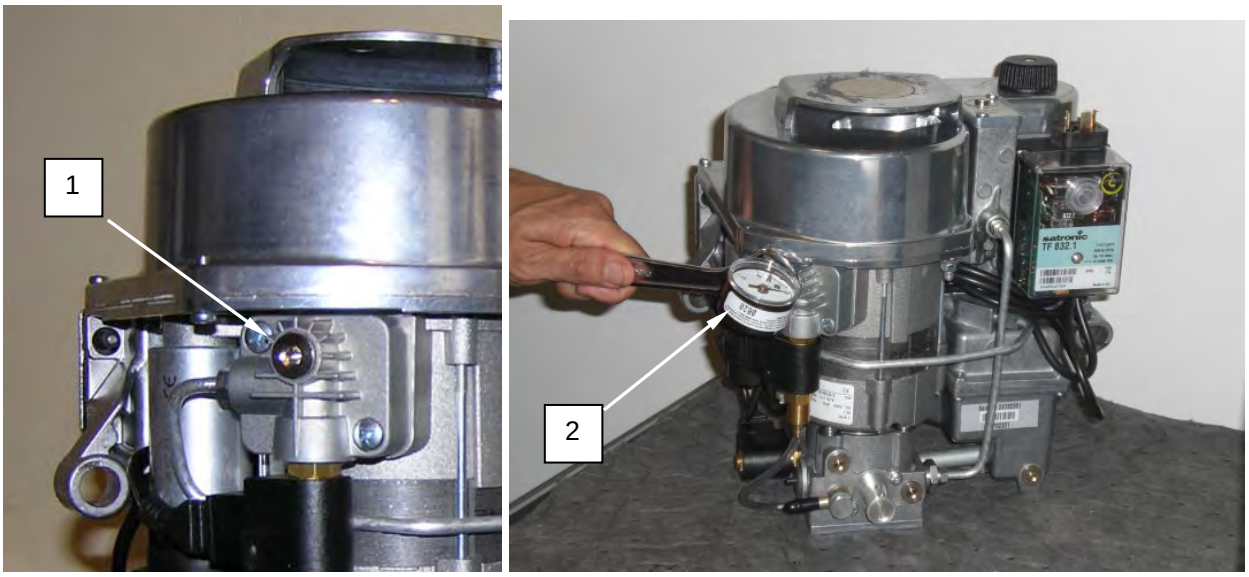


Figure 16. Pressure Gauge Placement.

3. Turn on the motor switch on the test box (Figure 17, Item 1). With the motor running, turn on the air control solenoid switch (Figure 17, Item 2).

Figure 17. Test Control Box.

TEST - CONTINUED

NOTE

Minor fluctuation of the compressor pressure gauge needle is normal.

a. A pressure reading of 20-32 PSI is within normal operating range.

b. A pressure reading higher than 32.0 may indicate a clogged orifice in the atomizing chamber. Turn off motor and air control solenoid switches and refer to WP 0046 for procedures for replacing the atomizing chamber.

c. A pressure reading below 20.0 may indicate poor compressor performance. Turn off motor and air control solenoid switches and replace piston ring and compressor O-Ring IAW WP 0043.

(1) If replacement of piston ring and compressor O-Ring does not fix the problem, replace the air control solenoid IAW WP 0043.

(2) If replacement of air control solenoid does not fix the problem, replace the compressor assembly IAW WP 0043.

4. Turn off motor test switch, remove compressor pressure gauge, and replace plug fitting.

5. If corrective action was taken, test fire burner IAW test firing paragraph in this WP.

END OF TASK

Fuel Pump Gauge Testing

1. Remove the metal screws in the fuel pump pressure gauge ports.

2. Both gauges are mounted on 1/2-inch coupling extensions (Figure 18, Item 1). Gently screw in the fuel pump vacuum gauge (Figure 18, Item 2) (negatively graduated) and pressure gauge (Figure 18, Item 3) (positively graduated) to the proper ports.

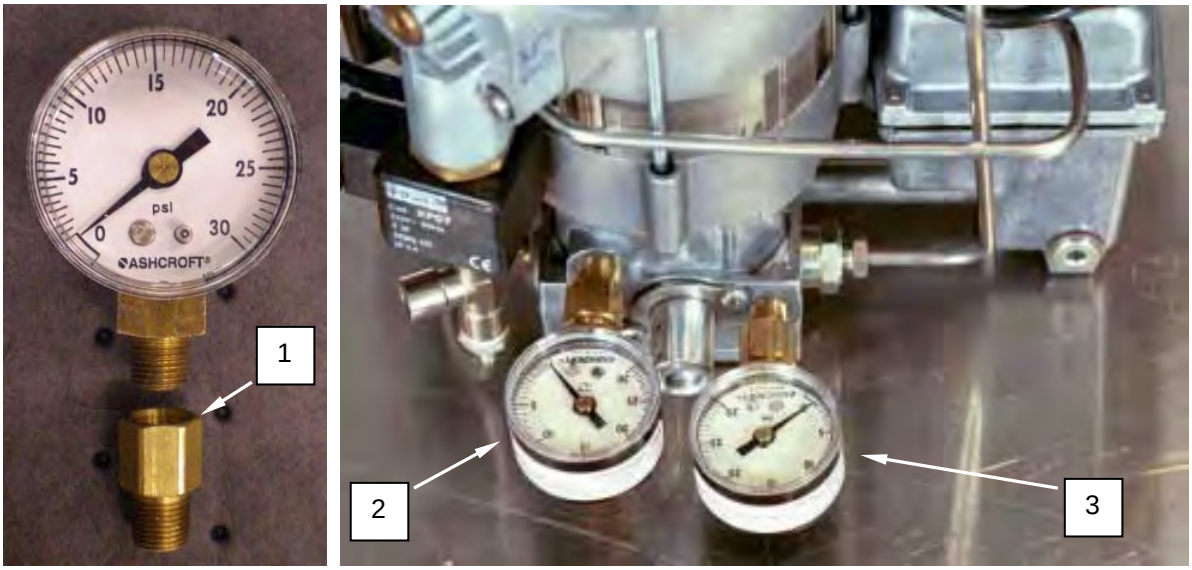


Figure 18. Vacuum and Pressure Gauge Placement.

TEST - CONTINUED

3. Turn on the motor control switch (Figure 19, Item 1) and the air control solenoid switch (Figure 19, Item 2).

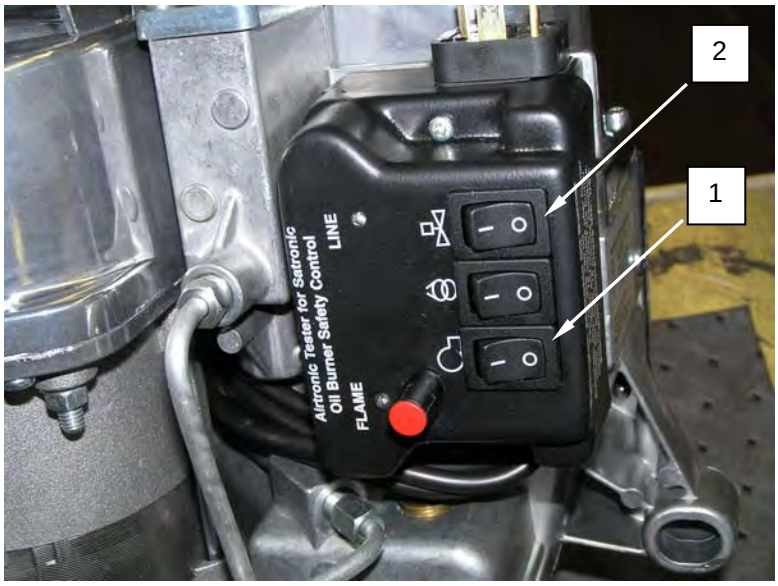


Figure 19. Test Control Box.

4. The fuel pump pressure gauge should read between 7.0 and 9.5 PSI. The fuel pump vacuum gauge should read between 4.5 inHg and 10.0 inHg.

   a. If pressure is within normal range, turn off motor control and air control solenoid switches.

   b. Fuel pump vacuum readings below 4.5 inHg may indicate a kinked fuel line, non-vented fuel can, and/or clogged fuel filter. Turn off motor control and air control solenoid switches and refer to WP 0010 to troubleshoot the fuel delivery system.

   c. If the vacuum gauge reading is out of tolerance (not between 4.5 inHg and 10.0 inHg) and the problem persists after the fuel delivery system has been checked, turn off motor control and air control solenoid switches and refer to WP 0045 for fuel pump replacement procedures.

5. Remove both gauges and extensions.

6. Reinstall metal screws and O-rings into fuel pump ports.

7. If corrective actions were taken, test fire burner IAW test firing paragraph in this WP.

END OF TASK

TEST – CONTINUED

Test Firing

Once troubleshooting has been completed, the following steps should be completed to verify proper burner operation.

WARNING

Ensure power to the TRH is disabled before installing the TRH Burner control box. If power is not disabled, the TRH Burner will attempt to fire. Failure to observe safety precautions may result in injury or death to personnel.

1. Turn power strip off to disable power to the TRH Burner.
2. Remove the diagnostic test box with the integral retaining screw.
3. Replace the diagnostic test box with the TRH Burner control box and tighten the retaining screw.
4. Press the reset button on the TRH Burner control box (Figure 20, Item 1).

Figure 20. Control Box Reset.

WARNING

DO NOT use any part of the body to cover the flame tube opening. Failure to observe safety precautions may result in injury or death to personnel.

5. Place the non-flammable object over the flame tube opening to block the light.
6. Turn power strip on to apply power to the TRH Burner.

TEST – CONTINUED

7. The motor should start running and the igniter should begin clicking. Within approximately 15 seconds the burner should fire. Once the burner is lit, remove the non-flammable object.

    a. If TRH Burner does not fire, refer to WP 0011 for troubleshooting procedures.

8. Allow the burner to run for 15 minutes ensuring the burner has a chance to burn the fuel in the fuel sump and refill it with new fuel.

    a. Once the 15 minutes has expired without problems or leaks, the TRH burner can be reinstalled in the TRH and operated normally.

    b. If TRH Burner does not run for the full 15 minutes, refer to WP 0011 for troubleshooting procedures.

9. Remove power cord from TRH Burner control box.

10. Remove fuel line from fuel port.

TEST – CONTINUED

WARNING

Use caution when draining fuel from the TRH Burner. Prevent a possible fire hazard by having absorbent materials or fuel mats on hand to absorb any spillage. Failure to observe safety precautions may result in injury or death to personnel.

WARNING

Use caution when draining fuel from the TRH Burner. Fuel draining from the TRH Burner fuel sump may flow rapidly. This could cause fuel spatter or spills on skin or clothing. Keep eyes protected and wash any clothing, equipment, or skin that is contaminated by fuel.

NOTE

Be sure to retrieve and replace sump plug after draining fuel from TRH Burner fuel sump. During removal, fuel sump plug may fall into drainage container. If this occurs do not forget to retrieve and replace sump plug.

11. Drain fuel from TRH burner by removing fuel sump drainage plug (Figure 21, Item 1) and draining fuel into an acceptable container (Figure 21, Item 2).

12. Reinstall fuel sump drainage plug.

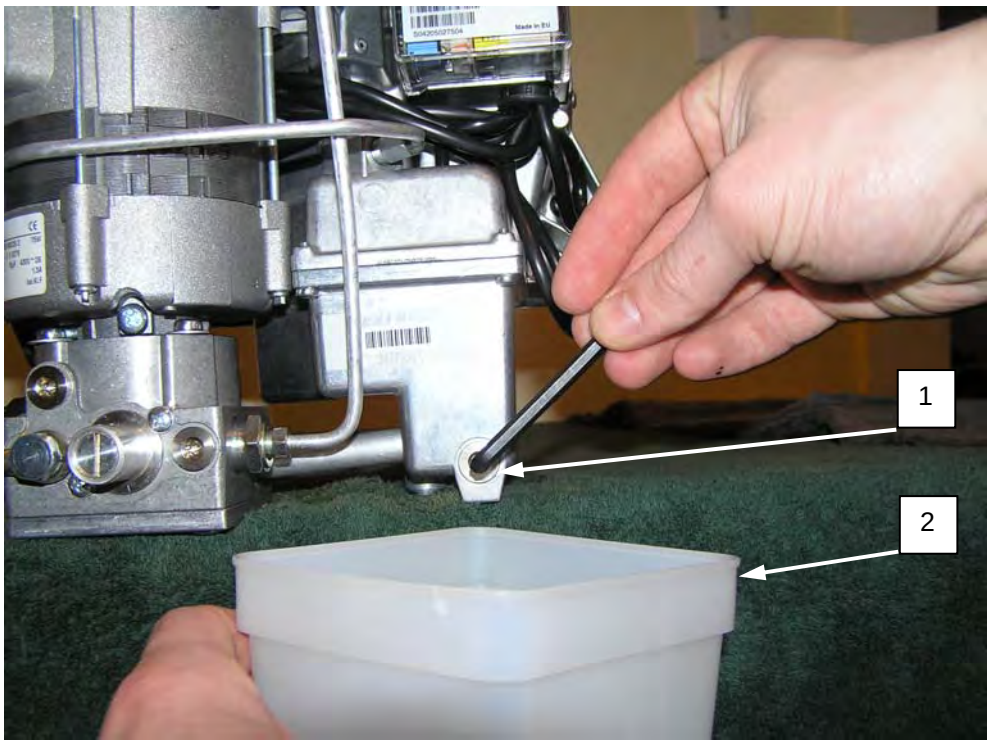


Figure 21. Draining Fuel Sump.

END OF TASK

END OF WORK PACKAGE

CHAPTER 6

OPERATOR MAINTENANCE INSTRUCTIONS FOR ASSAULT KITCHEN

OPERATOR MAINTENANCE

SERVICE UPON RECEIPT (ARMY ONLY)
PREFERRED INSTALLATION

INITIAL SETUP:

Tools and Special Tools

Maintenance Kit (WP 0066, Item 1)
Tool Kit (WP 0066, Item 3)

Personnel Required

Food Service Specialist 92G (2)
Licensed Forklift Operator – Non-MOS Specific (1)
Non-Specific MOS (1)

Materials/Parts

Electrical Component Tiedown Straps
(WP 0065, Item 17)

References

DA PAM 750-8
DD 361
TB 10-7360-230-23
WP 0002 WP 0013 WP 0014

SERVICE UPON RECEIPT OF MATERIAL

CHECKING UNPACKED EQUIPMENT

Inspect the equipment for damage incurred during shipment. If the equipment has been damaged, report the damage on DD 361, Transportation Discrepancy Report. Check the equipment against the packing slip or hand receipt to see if the shipment is complete. Report all discrepancies in accordance with DA PAM 750-8. Check to see whether the equipment has been modified. Inventory MBU components IAW WP 0002.

INSTALLATION INSTRUCTIONS

Cargo Strap Ratcheting Procedures

Refer to the following procedures to operate cargo strap ratchets:

1. Thread the free end of the cargo strap webbing (Figure 1, Item 1) through the hinge point opening in the ratchet between the top and bottom of the stay bar (Figure 1, Item 2).

2. Pull the cargo strap back over top of the stay bar (Figure 1, Item 2) and back on top of itself.

3. Keeping the strap tight, remove slack and operate the ratchet by simultaneously pulling the ratchet release (Figure 1, Item 3) towards the ratchet handle (Figure 1, Item 4) and moving the ratchet handle (Figure 1, Item 4) in and up and down motion, taking up the slack in the strap webbing.

4. Continue until all slack has been removed from the cargo strap.

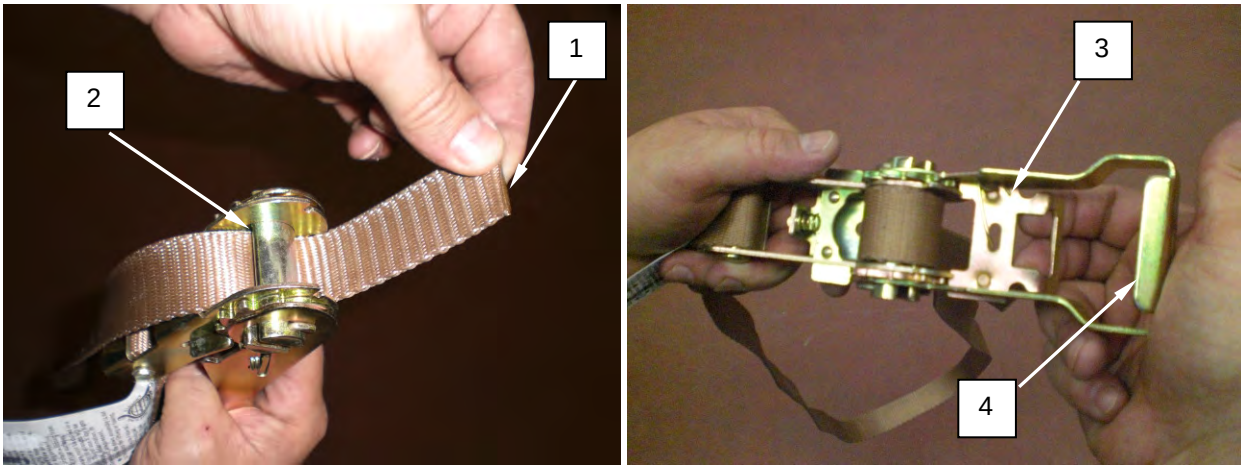


Figure 1. Cargo Strap Operation (Army Only).

INSTALLATION INSTRUCTIONS

M1097 or M1152 HMMWV Installation

For installation of Assault Kitchen components in a HMMWV cargo bed, use the numbering system outlined in Figure 2.

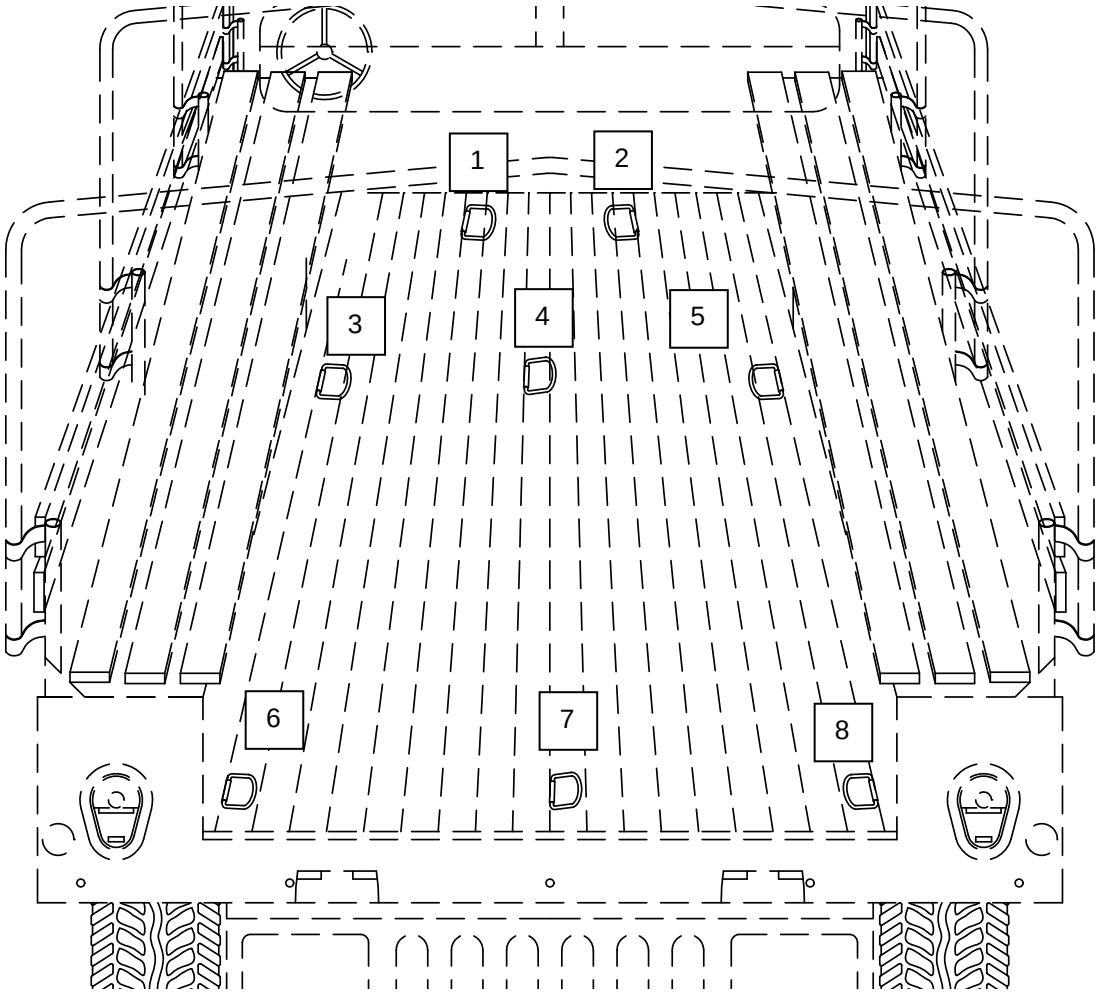


Figure 2. HMMWV D-Ring Placement (Army Only).

INSTALLATION INSTRUCTIONS – CONTINUED

1. Unpack all tools contained in the spare parts tool kit and consolidate them in the TRH tool box. Refer to WP 0002, Table 7 to inventory tool kit components.

2. Install cargo net in M1097 or M1152 as follows:

WARNING

Exercise caution when using cargo straps to secure equipment in the AK. Improper execution of strapping procedures may cause components to shift or become loose during travel. Failure to observe this warning may cause injury to personnel or damage to equipment.

NOTE

- During strapping procedures, adjustments should be made to the placement of components so that they fit properly in the vehicle cargo area. Before tightening straps and ratcheting into place, make adjustments to ensure components are as securely placed as possible.

- Final tightening of cargo strap(s) will not be accomplished until all items have been placed and all slack removed from strap(s).

a. Thread a 14-foot cargo strap through D-ring No. 2 (Figure 3, Item 1) and No. 3 (Figure 3, Item 2).

b. Thread another 14-foot cargo strap through D-ring No. 1 (Figure 3, Item 3) and No. 5 (Figure 3, Item 4).

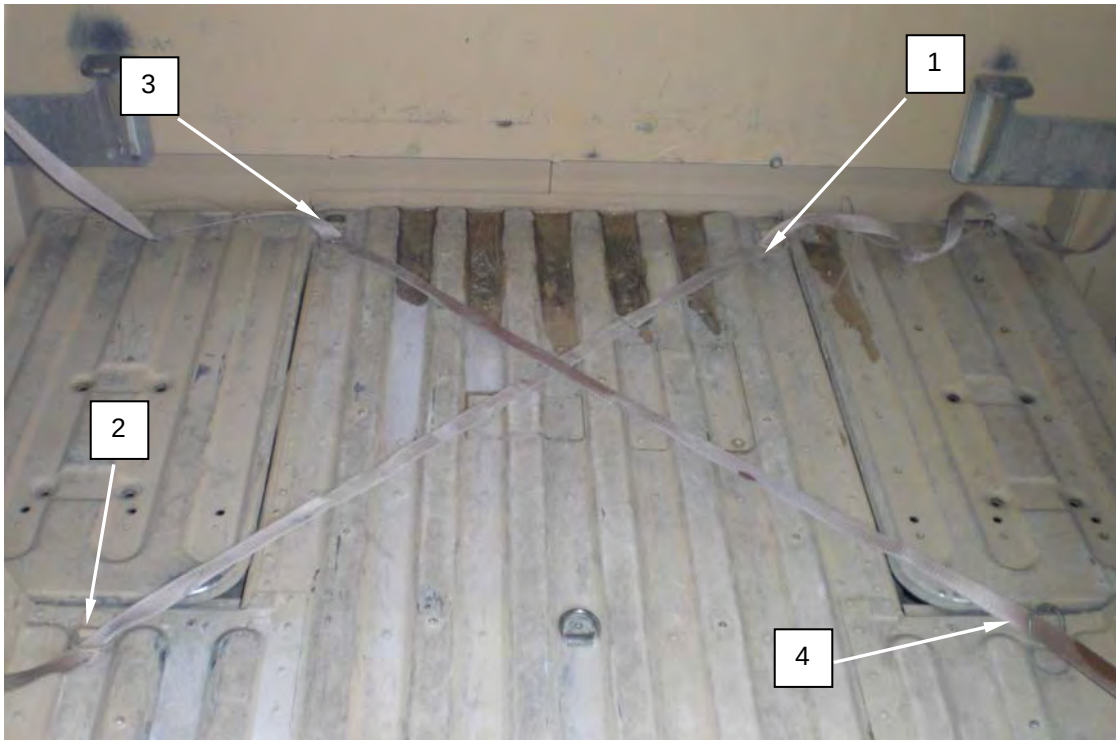


Figure 3. Attaching Cargo Netting to Canopy Support Post Hooks (Army Only).

c. Lay cargo net flat on ground.

d. Fold top to center and bottom to center.

INSTALLATION INSTRUCTIONS – CONTINUED

e. Place cargo net (Figure 4, Item 1) over cargo straps in back of HMMWV.

f. Place MBU toolkit in cargo net and fold net over MBU toolkit.

g. Bring cargo straps (Figure 4, Item 2) over cargo net and thread through ratchet but do not tighten ratchet at this point.

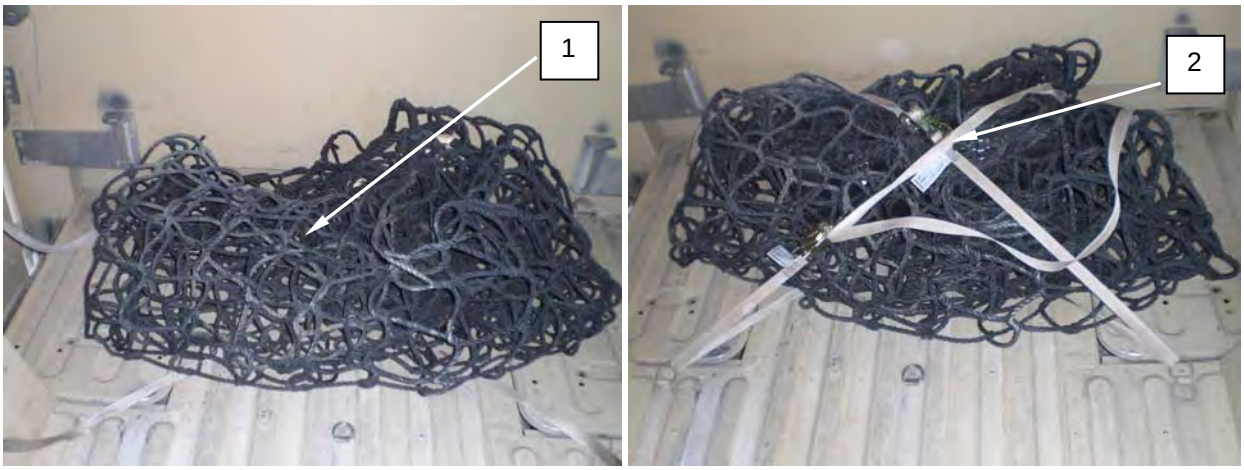


Figure 4. Cargo Strap Placement Under Cargo Netting (Army Only).

3. Install ice storage chest and stockpot assembly as follows:

a. Lay one 25-foot. cargo strap on left side of cargo bed floor and pass through D-rings number 3 and 6 (Figure 5, Item 1) on left side of cargo bed floor from front to rear of cargo bed.

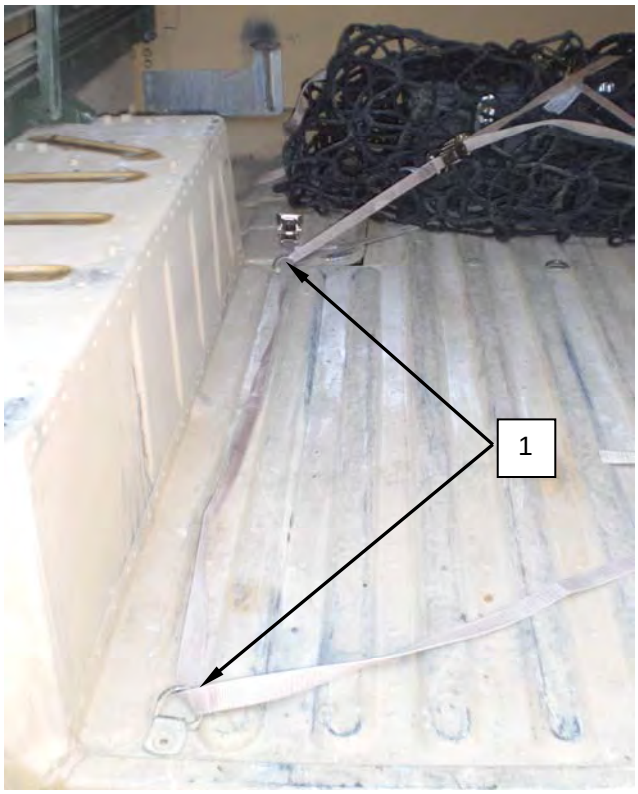


Figure 5. Ice Chest and Stockpot Cargo Strap Placement (Army Only).

INSTALLATION INSTRUCTIONS – CONTINUED

NOTE

- During strapping procedures, adjustments should be made to the placement of components so that they fit properly in the vehicle cargo area. Before tightening straps and ratcheting into place, make adjustments to ensure components are as securely placed as possible.

- Final tightening of cargo strap(s) will not be accomplished until all items have been placed and all slack removed from strap(s).

b. Place one 14-foot cargo strap through D-rings number 3 and 4 on front left side of cargo bed.

c. Place ice storage chest (Figure 6, Item 1) on left side of cargo bed on top of cargo straps, with drawer opening facing the rear of the vehicle.

d. Place stockpot assembly burner rack (Figure 6, Item 2) behind ice chest, with opening facing to the rear of the vehicle.

e. Install MBU (Figure 6, Item 3) in burner rack securely; ensuring MBU control panel is facing towards ice storage chest.

f. Place base rack (Figure 6, Item 4) over burner rack.

g. Place stockpot cradle (Figure 6, Item 5) on top of base rack.

h. Place both stockpots and lids in stockpot cradle and using two elastic cords, secure stockpot lid to stockpot assembly by hooking cord to burner rack frame on one side. Connect elastic cords together under lid handle (Figure 6, Item 6) and hook cord to opposite side of burner rack frame.

Figure 6. Ice Chest and Stockpot Cradle Placement (Army Only).

INSTALLATION INSTRUCTIONS – CONTINUED

i. Bring the 25-foot cargo strap (Figure 7, Item 1) from step a behind ice storage chest and wrap cargo strap one turn around handle of ice chest (Figure 7, Item 2). Route free end of strap around inner side of stockpot cradle assembly. Thread loose end of strap through ratchet and tighten on side of ice chest (Figure 8, Item 1).

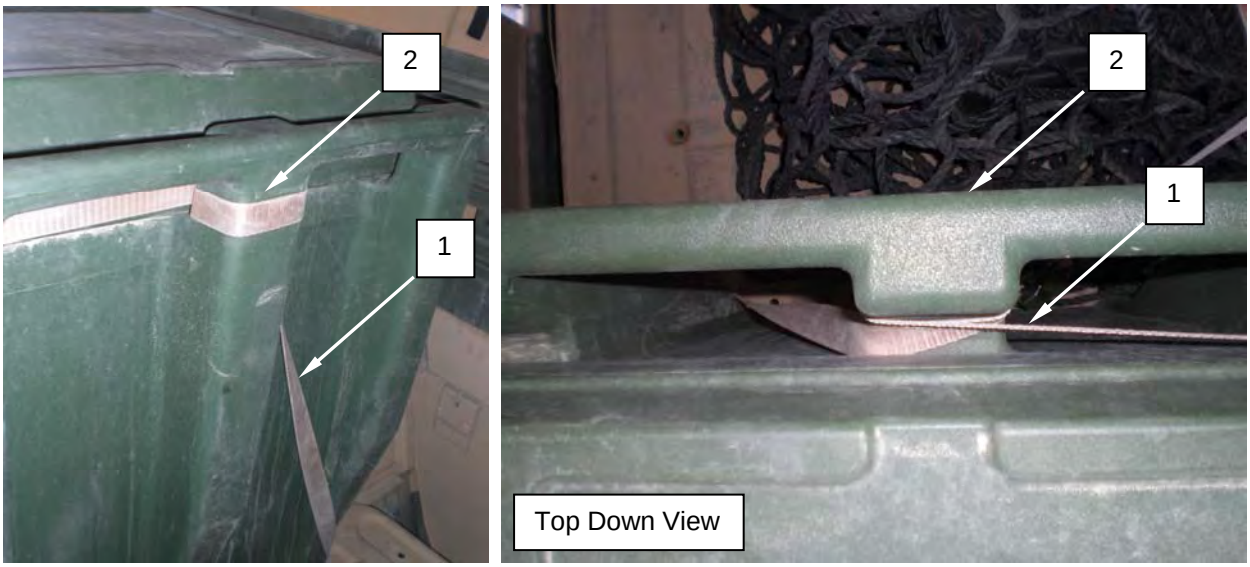


Figure 7. Ice Chest Strapping Procedure (Army Only).

j. Using the 14-foot cargo strap from step b (Figure 8, Item 2), secure ice storage chest by wrapping strap around ice chest and ratcheting on top of ice chest (Figure 8, Item 3).

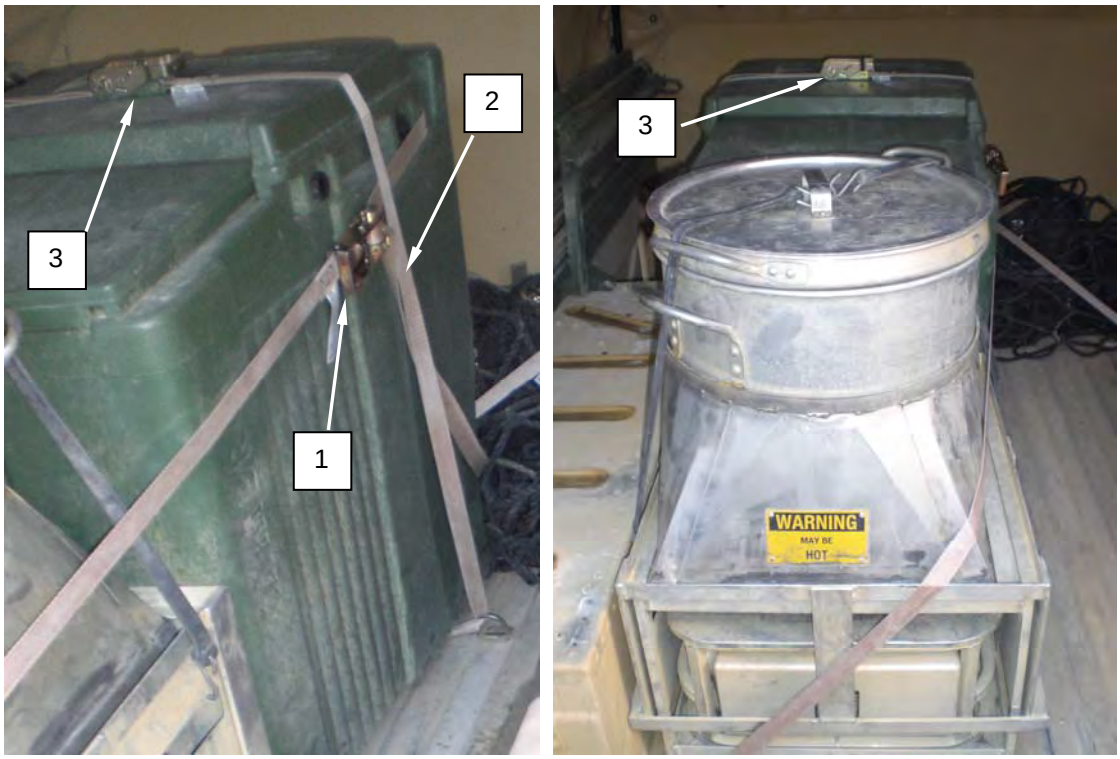


Figure 8. Ice Chest Securing Procedure (Army Only).

INSTALLATION INSTRUCTIONS – CONTINUED

4. Install water cans as follows:

NOTE

- During strapping procedures, adjustments should be made to the placement of components so that they fit properly in the vehicle cargo area. Before tightening straps and ratcheting into place, make adjustments to ensure components are as securely placed as possible.
- Final tightening of cargo strap(s) will not be accomplished until all items have been placed and all slack removed from strap(s).

a. Starting at the rear tailgate, place water cans and then fuel cans in sequence, with the spouts facing out (Figure 9, Item 1).

b. Thread a 14-foot cargo strap through D-ring No. 8, the fuel and water can handles, and D-ring No. 5.

c. Pass the cargo strap back through the fuel and water can handles, route strap through ratchet, and place on side of rear water can (Figure 9, Item 2). Do not tighten strap at this time.

d. Using another 14-foot cargo strap, wrap strap around fuel and water cans and ratchet on side of cans (Figure 9, Item 3) under previously placed strap.

e. Tighten both ratchets for a secure fit.

5. Ensure all slack is removed and all straps are tightened at this time.

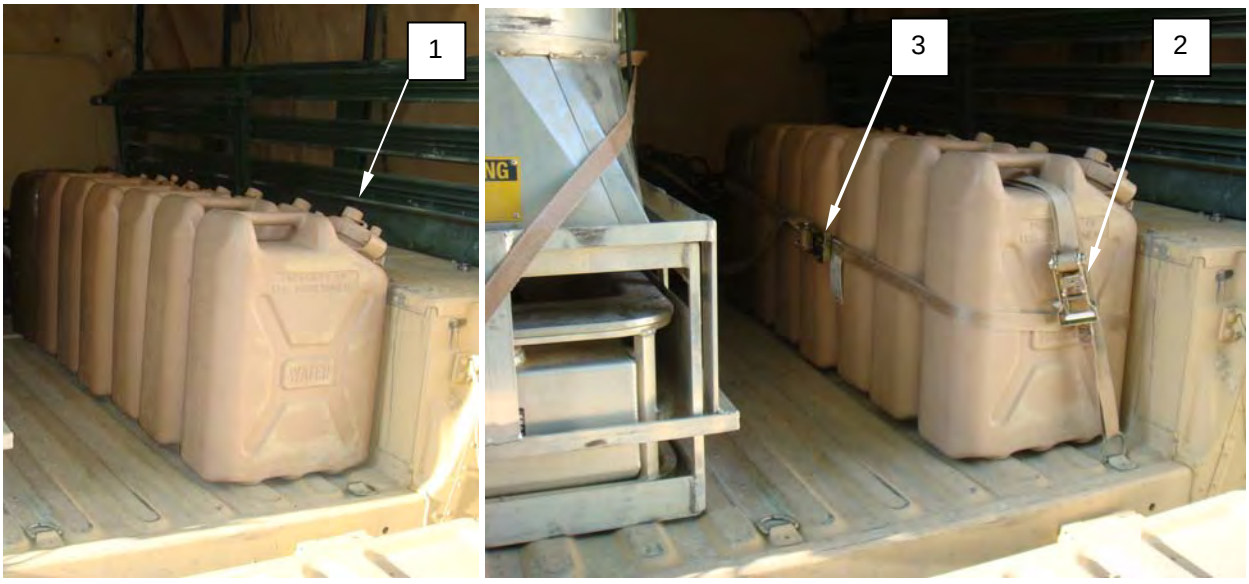


Figure 9. Water Can Placement (Army Only).

NOTE

Cargo may be added to support field feeding missions. Use the cargo net to secure cargo, ensuring that the MBU toolkit is also being secured with the cargo net. It is generally a good idea to install components before securing cargo to allow for proper placement of AK components.

INSTALLATION INSTRUCTIONS – CONTINUED

Preferred M1102 Trailer Installation

For installation of Assault Kitchen components in an M1102 trailer, use the alpha-numeric system outlined in Figure 10. D-rings assigned a number are standard M1102 D-rings. D-rings assigned a letter are added IAW TB 10-7360-230-23.

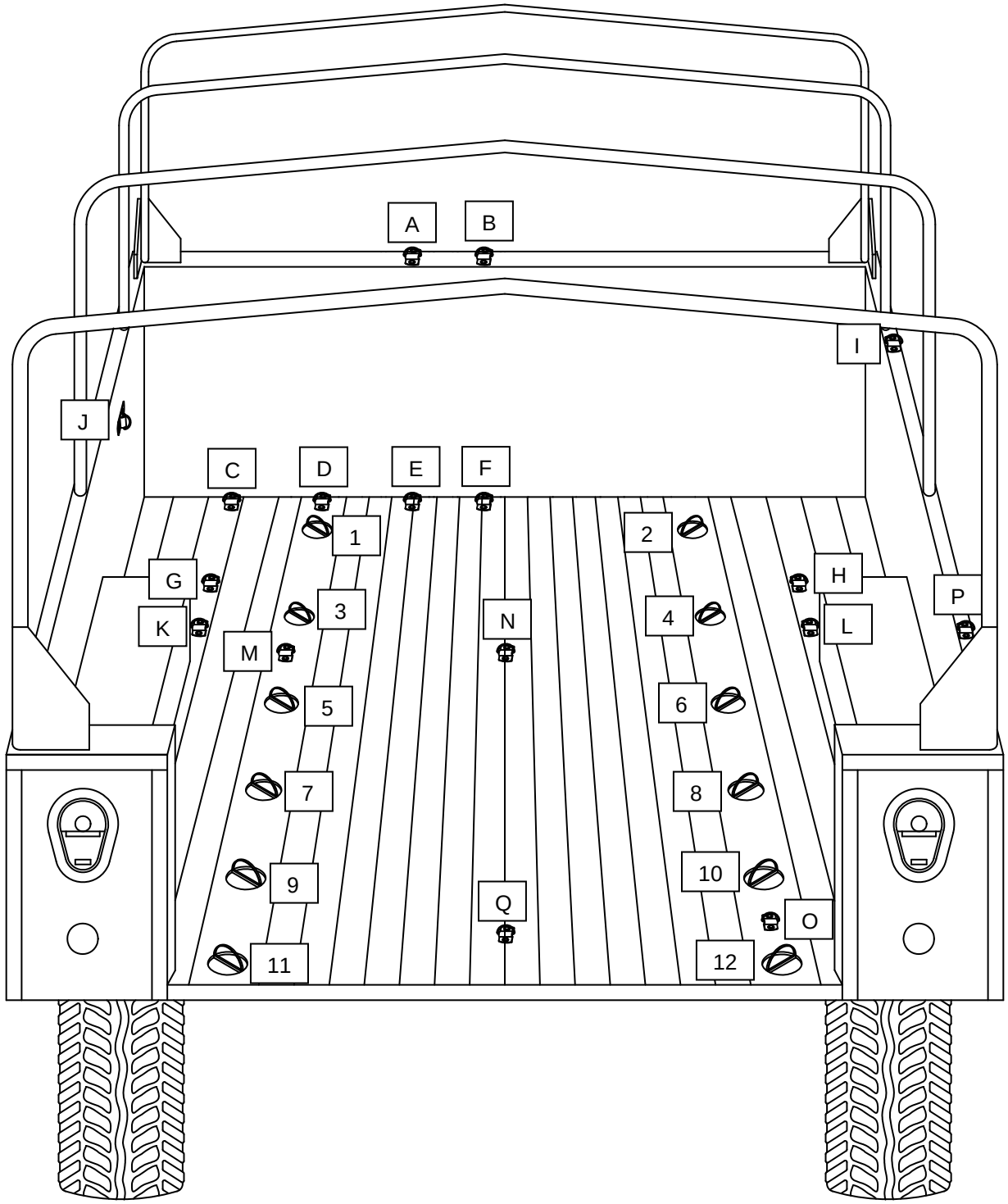


Figure 10. M1102 Trailer D-ring Placement (Army Only).

INSTALLATION INSTRUCTIONS – CONTINUED

For installation of Assault Kitchen components on an M1101 or M1102 LTT, it may be necessary to install brackets that secure AK components. To install brackets and AK components use the following procedures:

1. Install trailer's driver's side storage rack assembly as follows:

   a. Remove hardware from storage rack assembly support leg.

   b. Remove and retain the top mounted bolts from the four canopy support posts (Figure 11, Item 2) on the driver's side of the trailer.

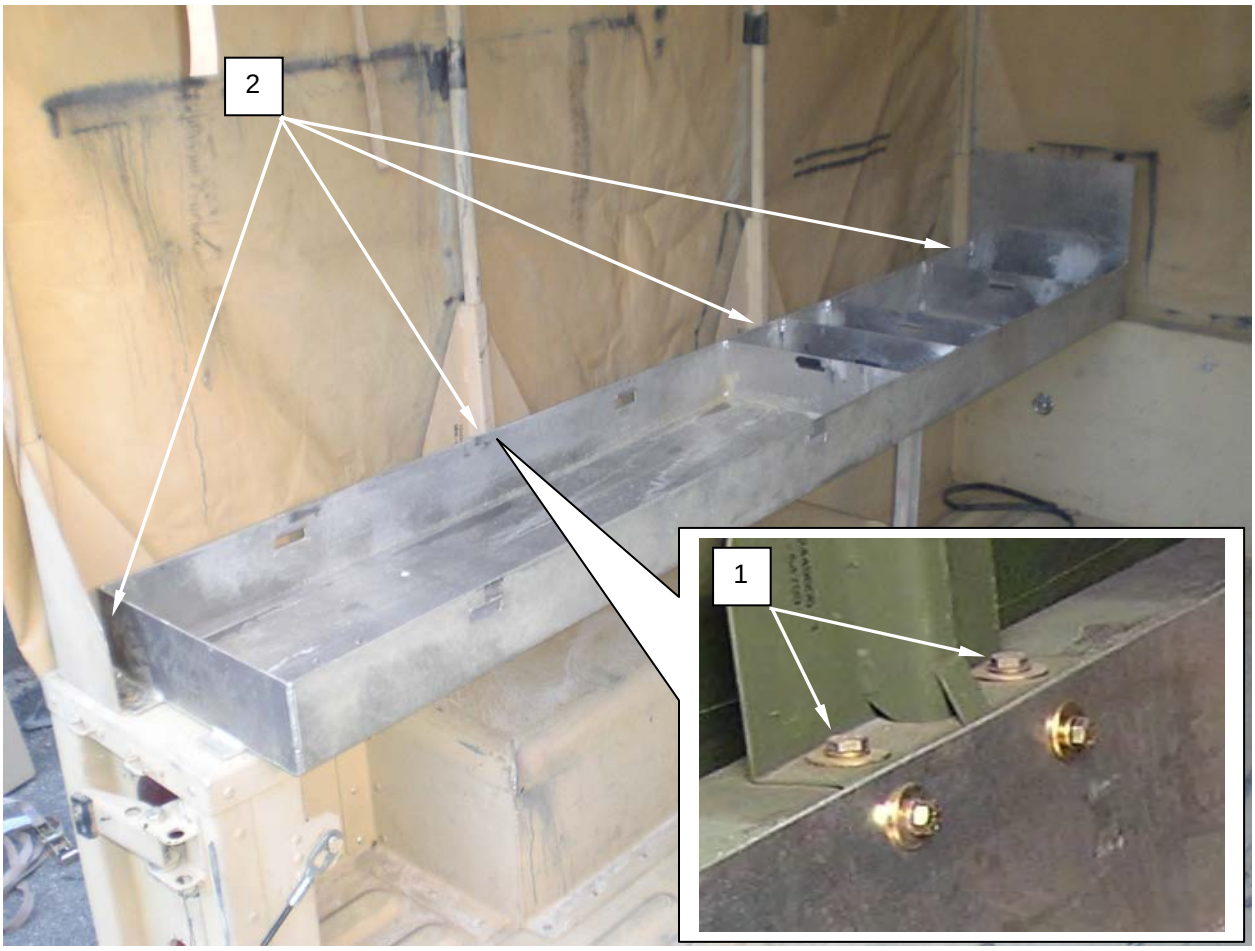


Figure 11. Trailer Driver Side Storage Rack (Army Only).

   c. Place storage rack into position and align storage rack screw holes with canopy support post bolt holes.

   d. Secure storage rack to trailer by hand tightening canopy support bolts.

INSTALLATION INSTRUCTIONS – CONTINUED

e. Align driver side storage rack with wheel well bolt hole (Figure 12, Item 1). Install and tighten bolt using two personnel. One person should place bolt and hold in place from inside cargo bed while the other tightens nut from outside wheel well.

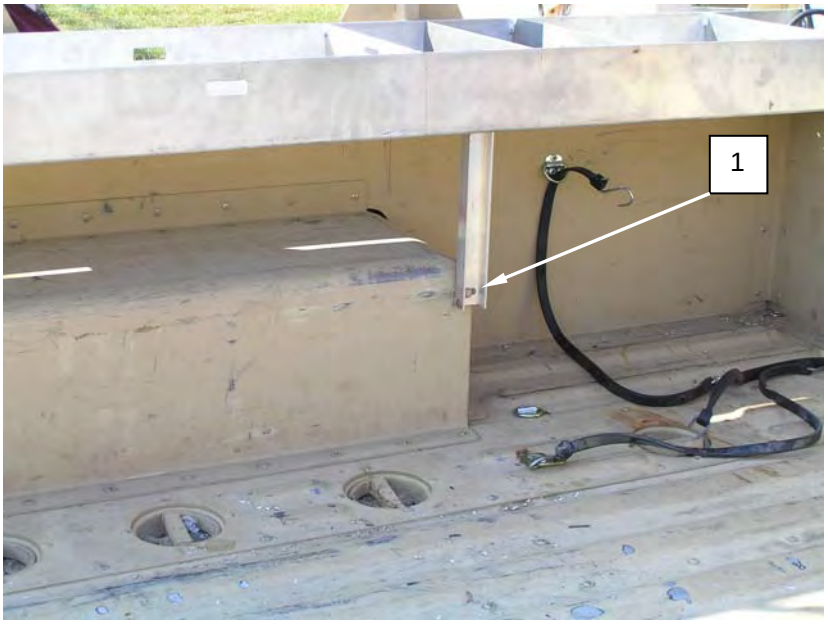


Figure 12. Securing Trailer Driver Side Storage Rack to Wheel Well (Army Only).

CAUTION

Be careful not to over-tighten canopy support bolts, as over-tightening bolts may strip the threaded inserts installed on the trailer.

f. Securely tighten canopy support bolts (Figure 13, Item 1), as required.

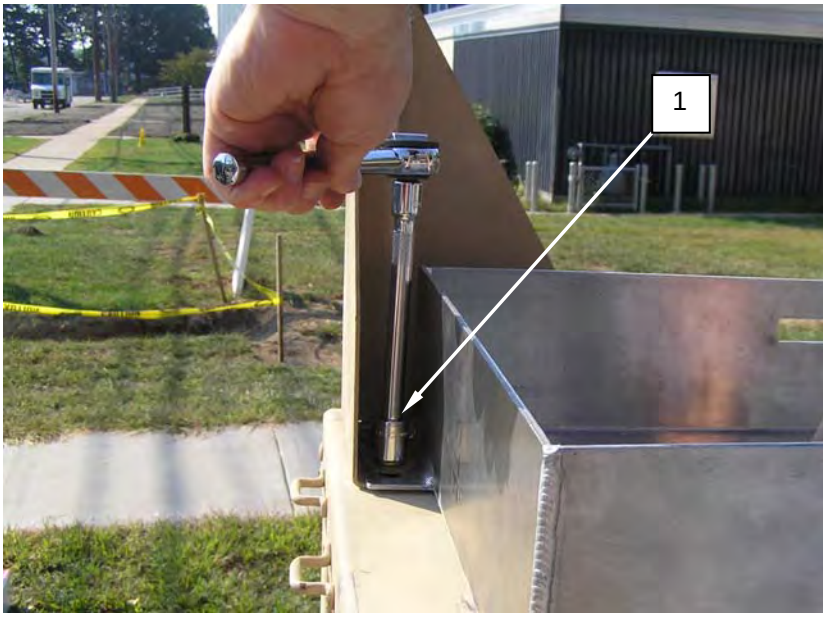


Figure 13. Securing Trailer Driver Side Storage Rack (Army Only).

INSTALLATION INSTRUCTIONS – CONTINUED

2. Install trailer's passenger side storage rack assembly as follows:

   a. Remove side mounted bolts (Figure 14, Item 1) from the middle two canopy support posts (Figure 14, Item 2) on passenger side of trailer.

   b. Remove connecting hardware from bottom of storage rack support bracket if installed.

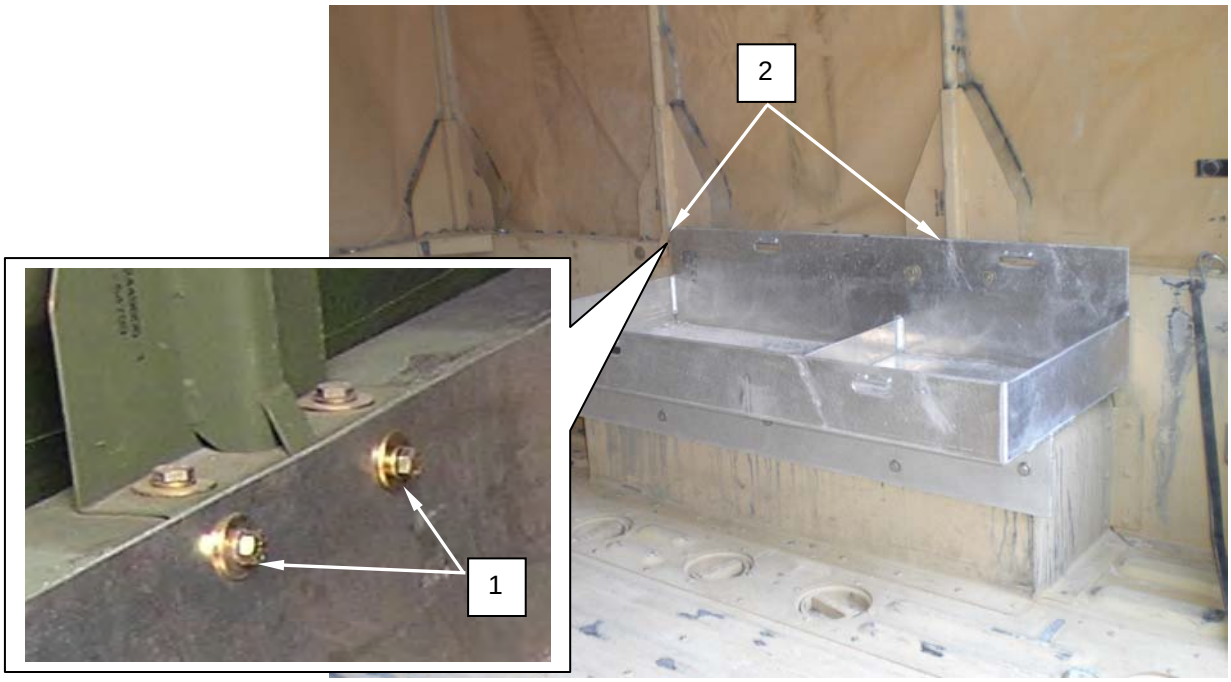


Figure 14. Trailer Passenger Side Storage Rack (Army Only).

   c. Align storage rack bracket holes with wheel well bolt holes.

   d. Install bolts (Figure 15, Item 1 and Item 2) to secure storage rack to trailer wheel well and support posts. Tighten securely.

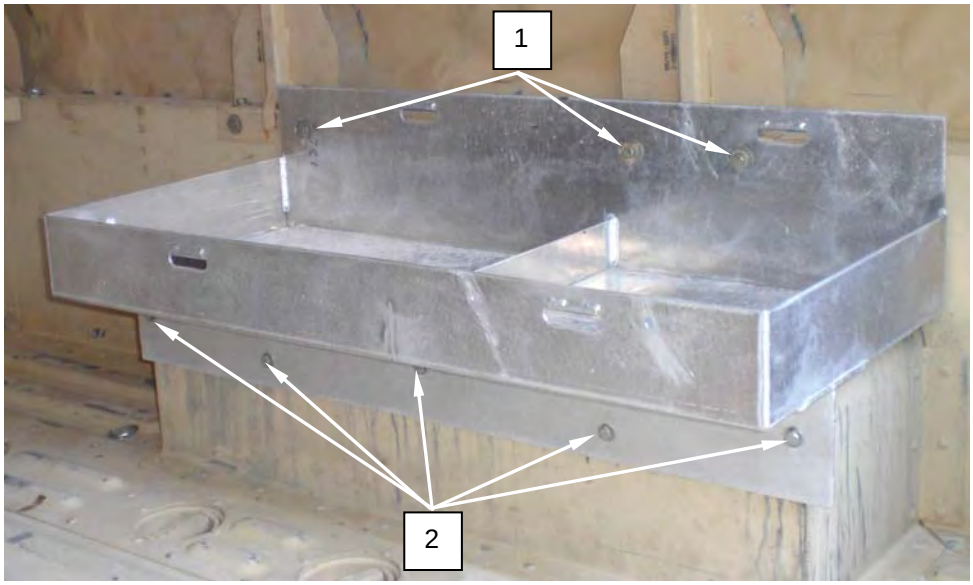


Figure 15. Securing Trailer Passenger Side Storage Rack (Army Only).

INSTALLATION INSTRUCTIONS – CONTINUED

3. Install large insulated side loading container on Passenger Side of trailer as follows:

   a. Stack two SLPCs (Figure 16, Item 1) in front right corner of trailer flush against the floor D-ring, approximately 5-inches from storage rack.

Figure 16. SLPC Placement (Army Only).

   b. Place a 25-foot cargo strap ratchet on top of SLPC, strap through handle facing tailgate with loose end draped down side of SLPC.

   c. Pass strap through D-ring (Figure 17, Item 1) on rear side of side loading food container.

Figure 17. SLPC Strap Down (Army Only).

INSTALLATION INSTRUCTIONS – CONTINUED

d. Bring strap back up to top of side loader, through handles, and down front side of food container.

e. Pass strap through D-ring (Figure 18, Item 1) on front side of side loading food container.

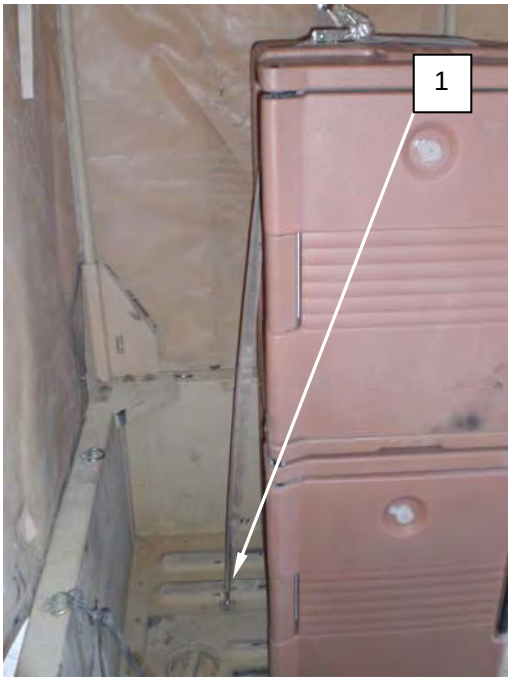


Figure 18. SLPC Strap Down (Army Only).

f. Bring strap back up to top of side loader, through handle and ratchet on top (Figure 19, Item 1).

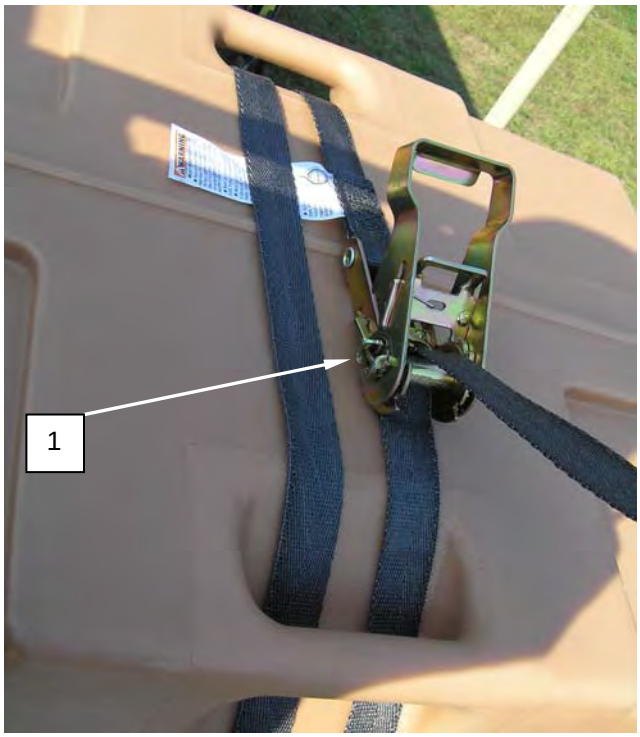


Figure 19. SLPC Ratchet Placement (Army Only).

INSTALLATION INSTRUCTIONS – CONTINUED

4. Install IFCs in passenger side storage rack as follows:

   a. Using a 25-foot cargo strap, pass loose end of strap through outside left opening of passenger side storage rack, outside in, and secure ratchet end (Figure 20, Item 1) and strap end (Figure 20, Item 2) between canopy and canopy support pole to keep strap out of the way.

Figure 20. IFC Placement (Army Only).

INSTALLATION INSTRUCTIONS – CONTINUED

b. Stack five IFCs (Figure 21, Item 1) in passenger side storage rack.

Figure 21. IFC Placement (Army Only).

INSTALLATION INSTRUCTIONS – CONTINUED

c. Bring cargo strap in front of IFCs, pass through inner left opening in storage rack (Figure 22, Item 1), and ratchet in front of IFCs (Figure 22, Item 2). Tuck strap excess behind IFC stack and out of the way.

d. Using a 14-foot cargo strap, wrap cargo strap around second container in stack from the top IFC, one turn around the first canopy support post (Figure 22, Item 3), around back of IFC stack, and one turn around second canopy support post (Figure 22, Item 4). Pass strap through ratchet and tighten in front of IFCs (Figure 22, Item 5).

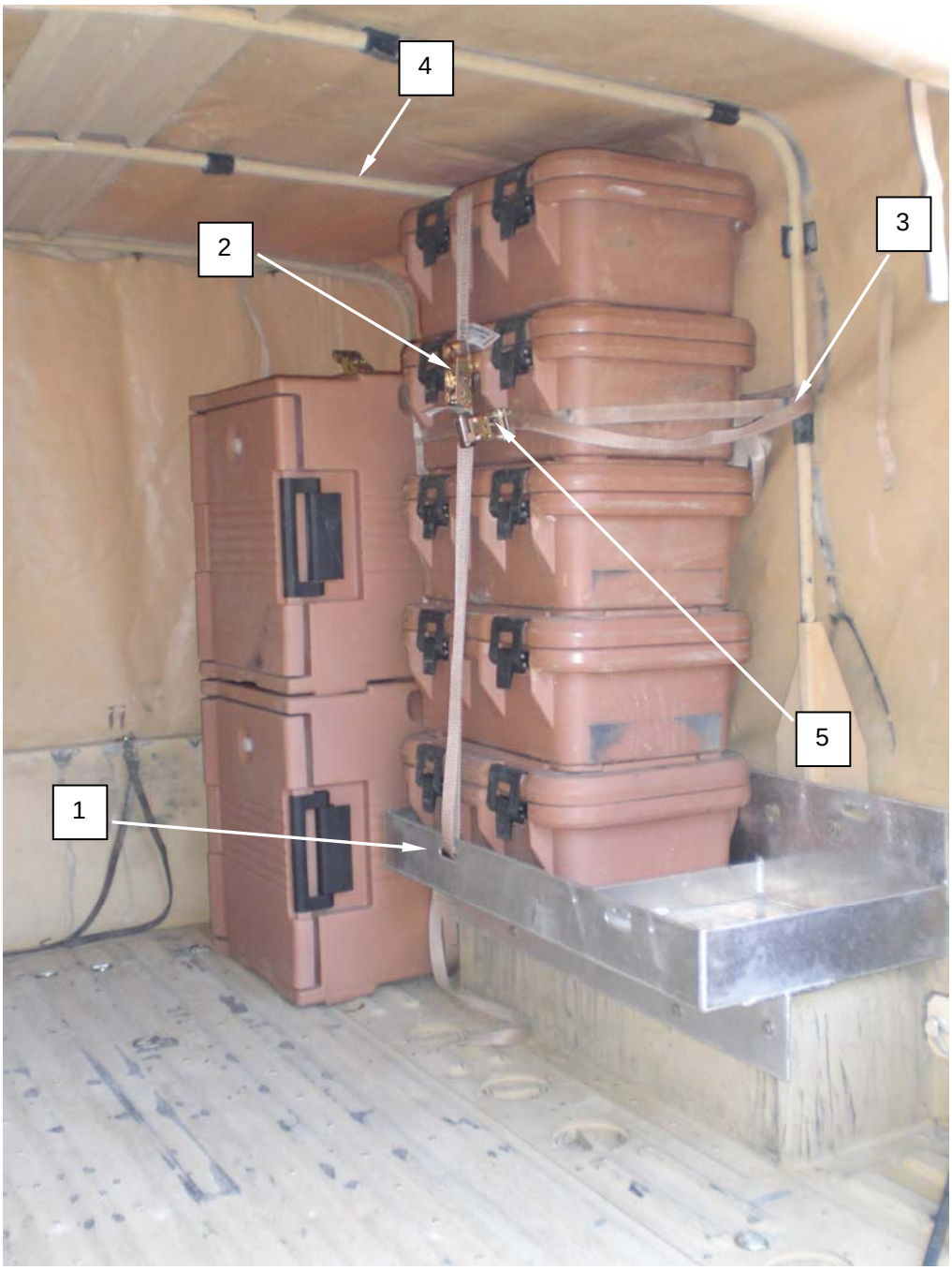


Figure 22. IFC Ratchet Placement (Army Only).

INSTALLATION INSTRUCTIONS – CONTINUED

5. Install two beverage dispensers in passenger side storage rack as follows:

   a. Place one beverage dispenser in storage rack.

   b. Pass strap end through rear opening of passenger side storage rack. Using a 14-foot cargo strap, secure ratchet end by placing between cargo canopy and canopy support pole.

   c. Pass strap over top of beverage dispenser on either side of lid handle and through front opening of storage rack (Figure 23, Item 1).

Figure 23. Beverage Dispenser Placement (Army Only).

INSTALLATION INSTRUCTIONS – CONTINUED

d. Place second beverage dispenser in storage rack under strap being sure to align handles and relief valve caps of both dispensers.

e. Pass cargo strap over top of beverage dispenser and route strap on opposite side of lid handle as previously routed cargo strap (Figure 24, Item 1).

f. Ratchet cargo strap on side of beverage dispenser (Figure 24, Item 2).

Figure 24. Beverage Dispenser Placement (Army Only).

INSTALLATION INSTRUCTIONS – CONTINUED

6. Install one beverage dispenser between passenger side storage rack and rear wall of trailer as follows:

   a. Place beverage dispenser between passenger side storage rack and rear wall of trailer (Figure 25, Item 1).

   b. Strap beverage dispenser into place by attaching an elastic cord to the d-ring on Passenger Side of trailer wall (Figure 25, Item 2), passing cord through beverage dispenser handles, and connecting to D-ring on floor at opposite side of beverage dispenser (Figure 25, Item 3).

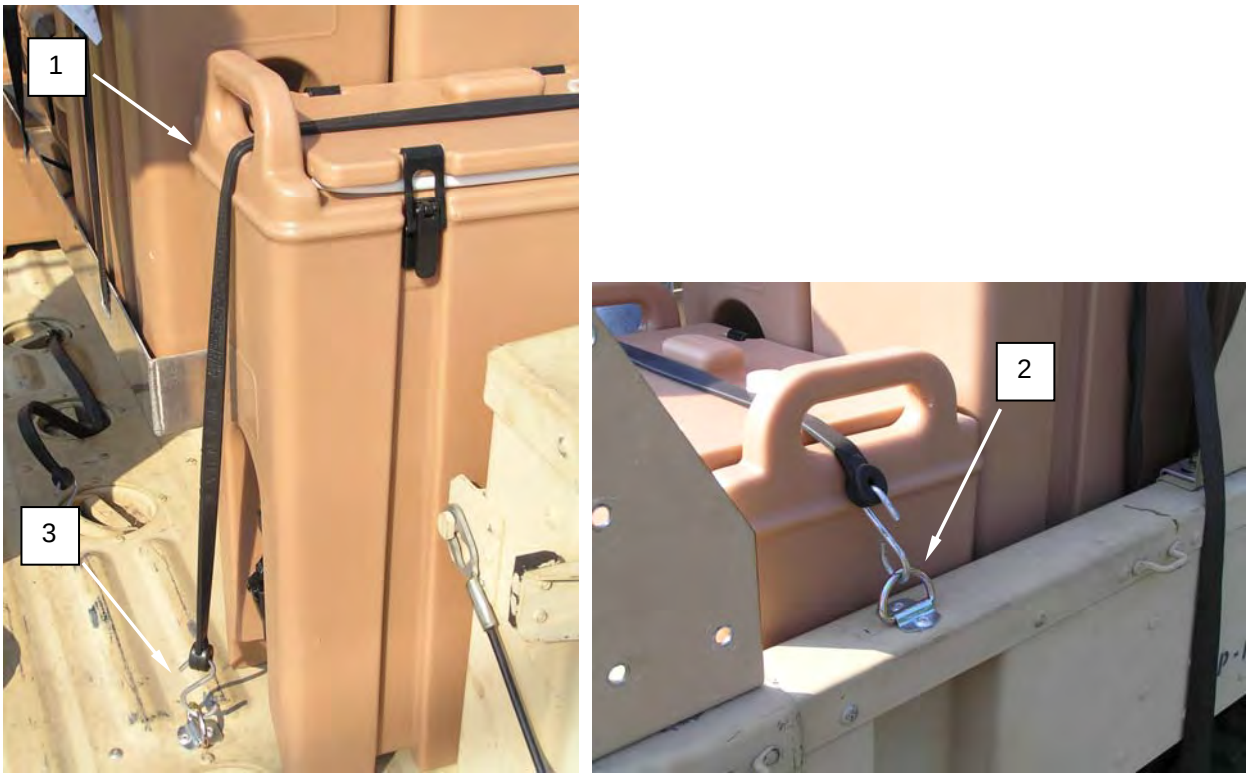


Figure 25. Beverage Dispenser Placement (Army Only).

INSTALLATION INSTRUCTIONS – CONTINUED

7. Install three beverage dispensers in front of trailer as follows:

   a. Place one beverage dispenser in front passenger side corner of trailer between side loading carrier and front wall of trailer (Figure 26, Item 1).

   b. Align two remaining beverage dispensers next to previously placed dispenser (Figure 26, Item 2).

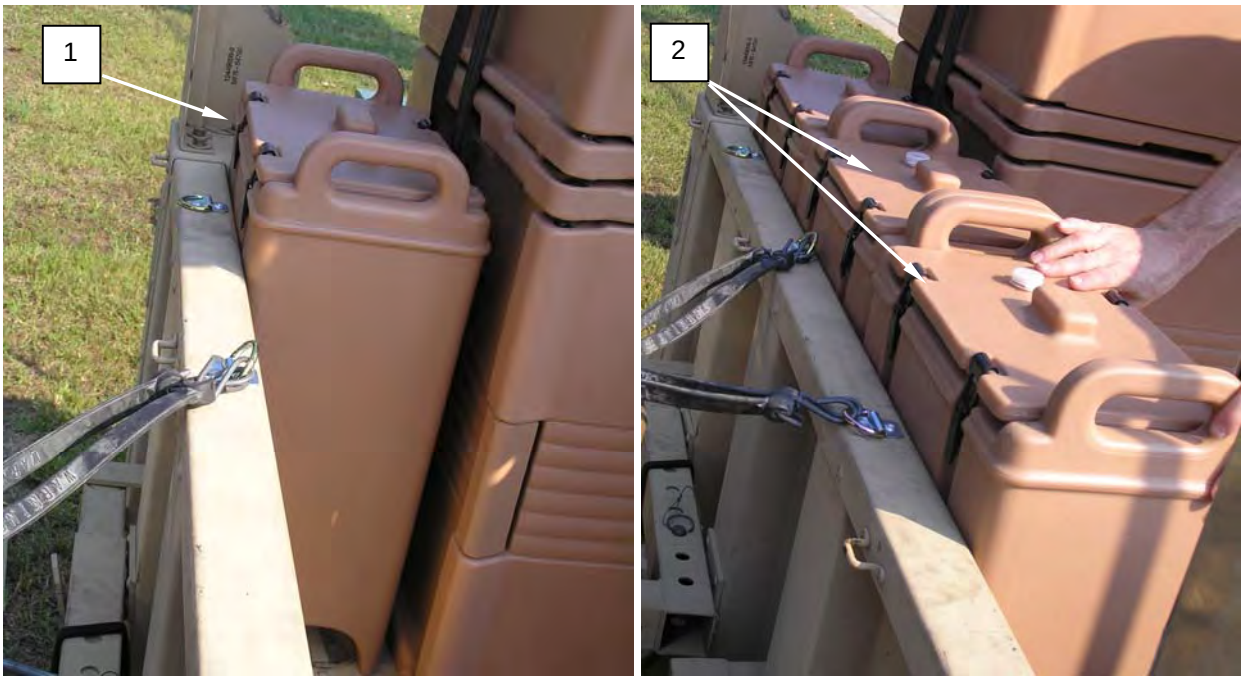


Figure 26. Beverage Dispenser Placement (Army Only).

INSTALLATION INSTRUCTIONS – CONTINUED

c. Using attached elastic cords, pass cords over top of beverage dispensers and attach to D-rings on trailer's cargo floor (Figure 27, Item 1).

Figure 27. Beverage Container Elastic Hook Ups (Army Only).

INSTALLATION INSTRUCTIONS – CONTINUED

d. Using a 14 ft. cargo strap, pass cargo strap through D-ring No. 1 (Figure 28, Item 1).

Figure 28. Beverage Container Strap Down (Army Only).

e. Run cargo strap over beverage containers and through D-ring on top of passenger side wall of trailer (Figure 29, Item 1). Run strap to left or right of lid handles

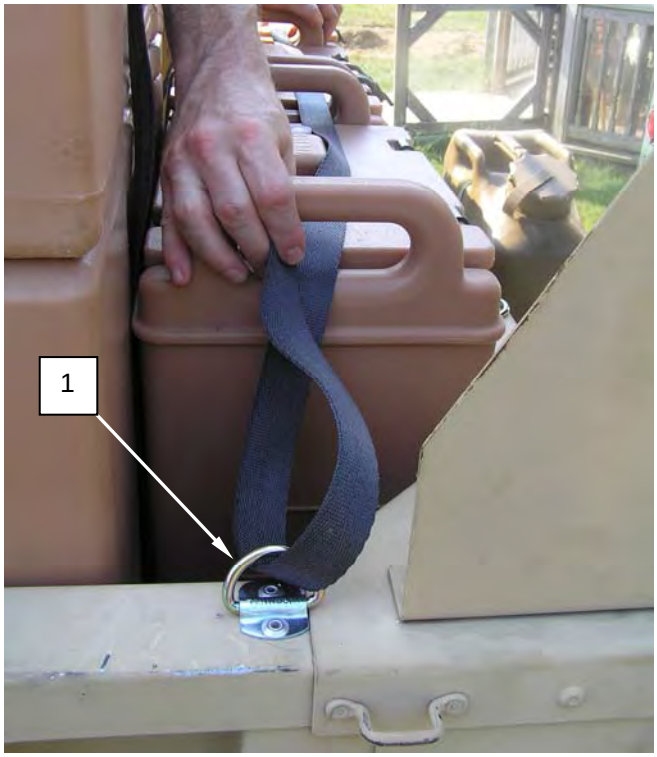


Figure 29. Beverage Container Strap Down (Army Only).

INSTALLATION INSTRUCTIONS – CONTINUED

f. Run cargo strap back over beverage containers and ratchet into place on left side of beverage container (Figure 30, Item 1). Run strap to opposite side of lid handles used in previous step.

Figure 30. Beverage Container Strap Down (Army Only).

8. Install inverter in front compartment of trailer's left side storage rack as follows:

a. Ensure inverter power cord is connected to press fit adapter assembly.

INSTALLATION INSTRUCTIONS – CONTINUED

b. If necessary, remove two bracket retaining bolts (Figure 31, Item 1). Keep bolts, nuts and washers nearby.

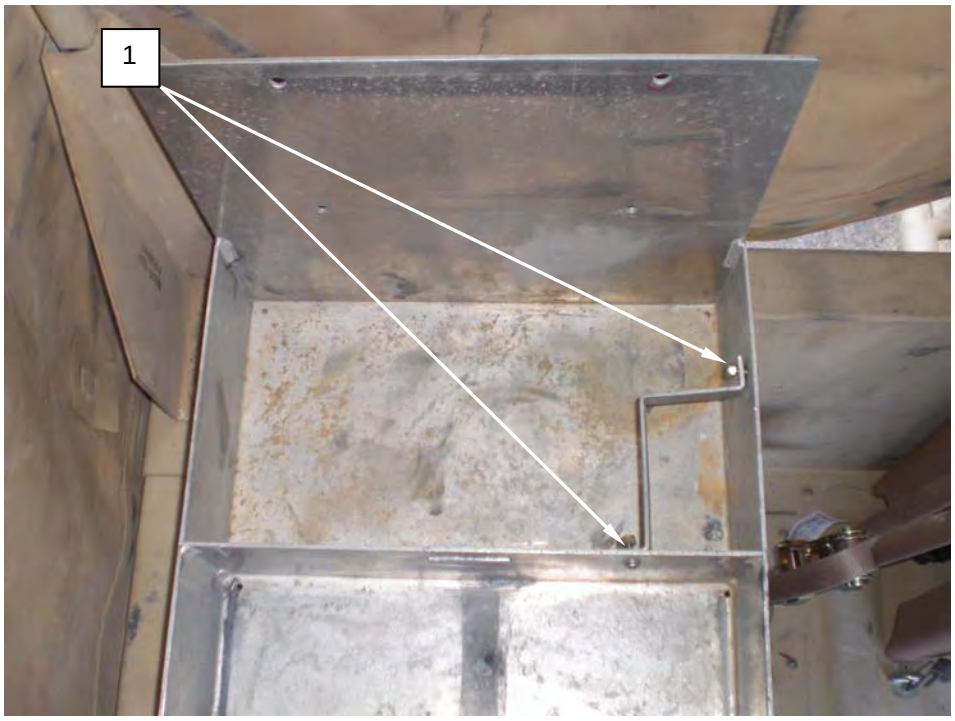


Figure 31. Inverter Power Cord and Press Fit Adapter Placement (Army Only).

c. Place press fit adapter top down into right rear corner in front compartment of the left side storage rack with back of adapter flush with compartment back wall (Figure 32, Item 1) as shown.

Figure 32. Inverter Power Cord and Press Fit Adapter (Army Only).

INSTALLATION INSTRUCTIONS – CONTINUED

d. Ensuring all cords are clear and not obstructing work area, secure NATO plug adapter into place with bracket and two retaining bolts (Figure 33, Item 1).

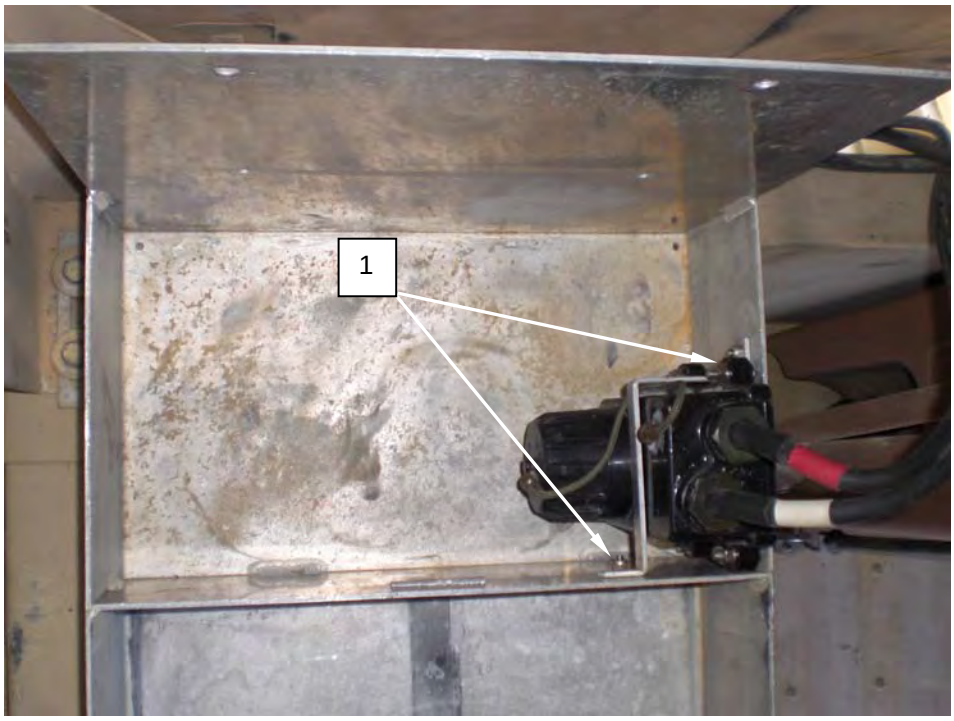


Figure 33. Securing Inverter Power Cord and Press Fit Adapter (Army Only).

e. Mount the inverter to the support wall in the front of the driver's side storage rack by loosening the hex head bolts with an adjustable wrench (Figure 34, Item 1). Align the inverter mounting grooves with the storage rack holes so that the inverter controls are facing in.

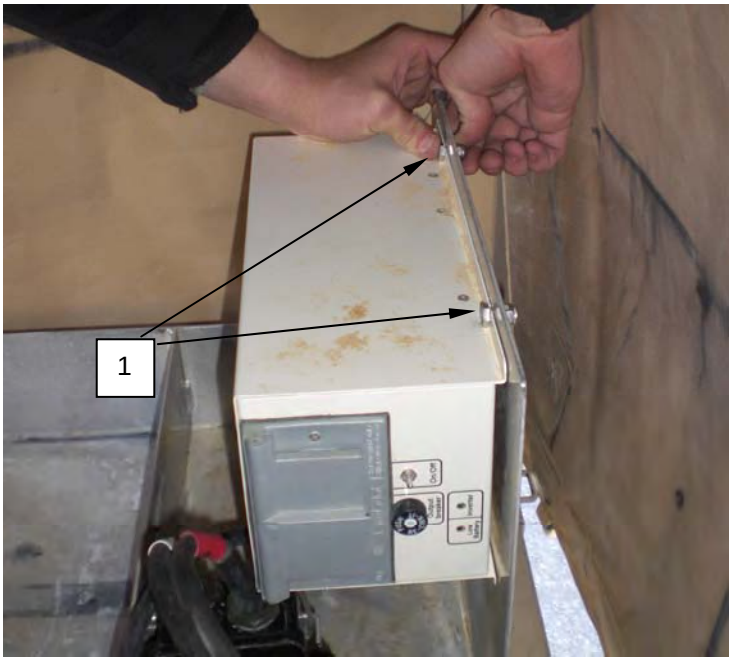


Figure 34. Inverter Placement (Army Only).

INSTALLATION INSTRUCTIONS – CONTINUED

f. Tighten the hex head bolts on top (Figure 35, Item 1) and bottom of inverter.

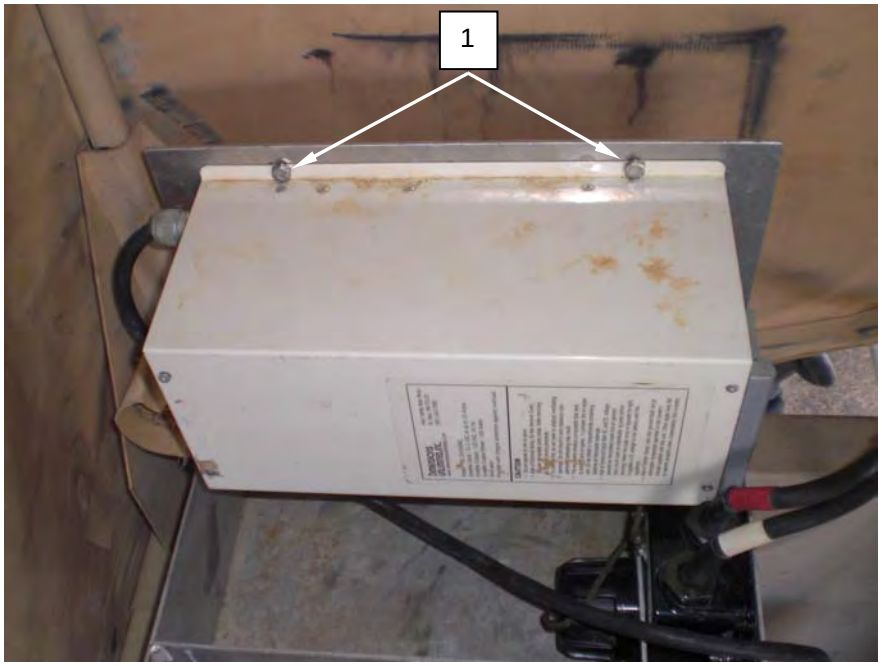


Figure 35. Securing Inverter Assembly (Army Only).

g. Press fit NATO plug on inverter into NATO plug adapter. Secure excess cord inside trailer storage bracket.

h. Secure the power cord to D-ring A, located at the front of the trailer, with a plastic cable tie (Figure 36, Item 1).

Figure 36. Securing Power Cord to Trailer D-Ring (Army Only).

INSTALLATION INSTRUCTIONS – CONTINUED

CAUTION

Ensure sufficient slack exists between trailer and HMMWV, to allow for freedom of movement. Failure to adhere to this caution may cause damage to the NATO adapter cable.

i. Secure the power cord to the D-Ring at the center of the HMMWV tailgate (Figure 37, Item 1).

Figure 37. Securing Power Cord to HMMWV Strap Loop (Army Only).

j. Remove the storage well cover (Figure 38, Item 1) located in the front passenger side of the HMMWV cargo area by turning the two, quarter-turn fasteners on the storage well cover.

k. Attach NATO extension adapter (Figure 38, Item 2) to outlet in storage well by aligning posts and screwing collar onto outlet threads.

Figure 38. NATO Extension Adapter Connection (Army Only).

INSTALLATION INSTRUCTIONS – CONTINUED

9. Install the maintenance kit in the second compartment of the trailer's left side storage rack as follows:

    a. Pass a 14-foot cargo strap through the front opening (Figure 39, Item 1), and then the rear opening (Figure 39, Item 2) of the driver side storage rack compartment (Figure 39, Item 3) next to the inverter.

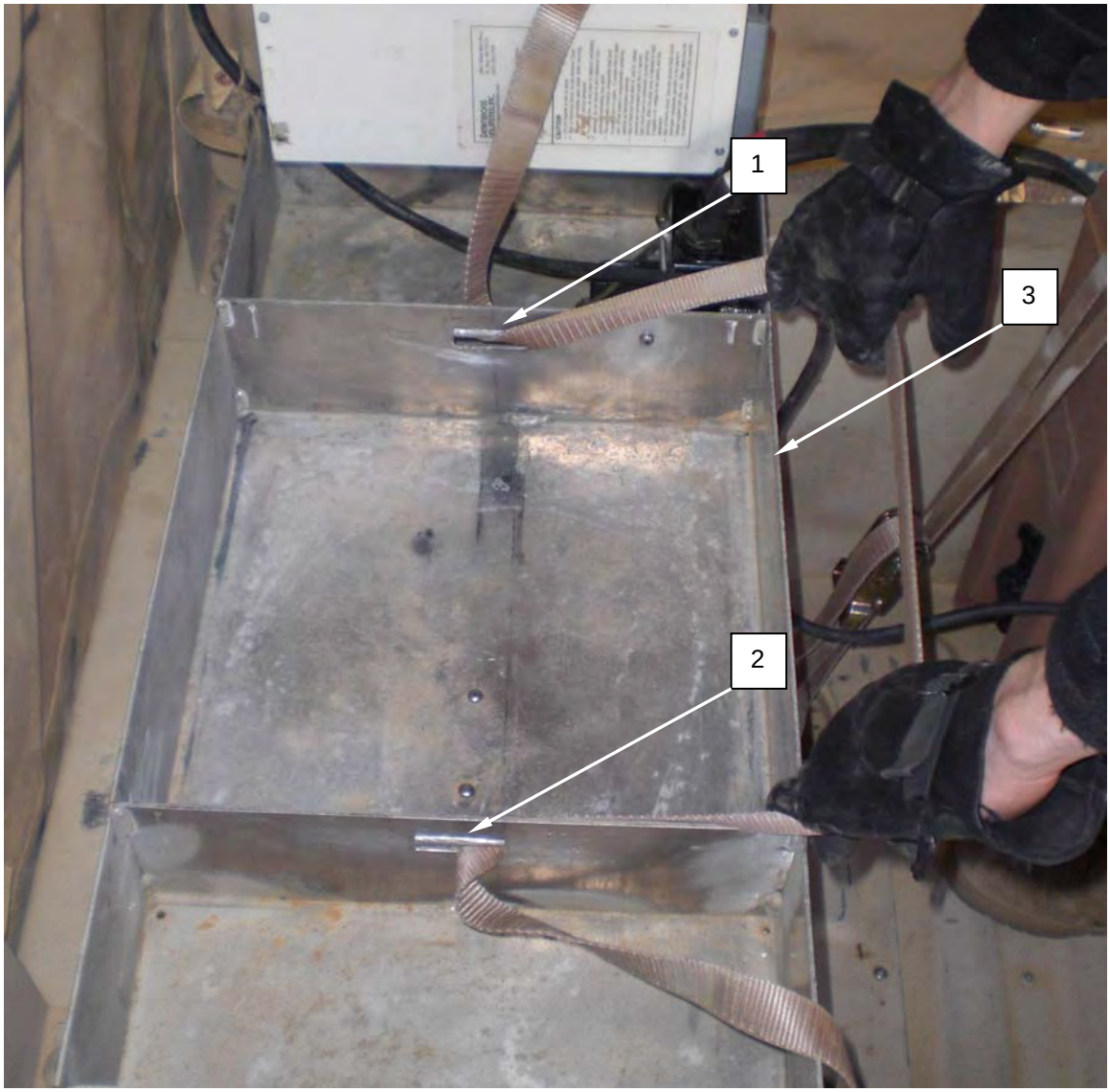


Figure 39. Maintenance Kit Placement (Army Only).

INSTALLATION INSTRUCTIONS – CONTINUED

b. Position cargo strap out of the way so that placement of maintenance kit can be performed without interference.

c. Place the maintenance kit (Figure 40, Item 1) in the driver side storage rack compartment next to the inverter.

d. Place the cargo strap (Figure 40, Item 2) above the maintenance kit and ratchet on top of the kit.

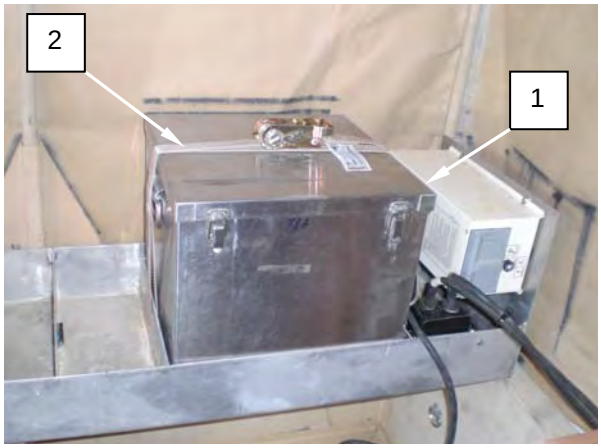


Figure 40. Maintenance Kit Tie Down (Army Only).

10. Install Fuel can adapter as follows:

a. Unscrew and remove fuel can cap (Figure 41, Item 1).

b. Push plastic dip tube (Figure 41, Item 2) into underside of fuel adapter cap (Figure 41, Item 3) until held in place.

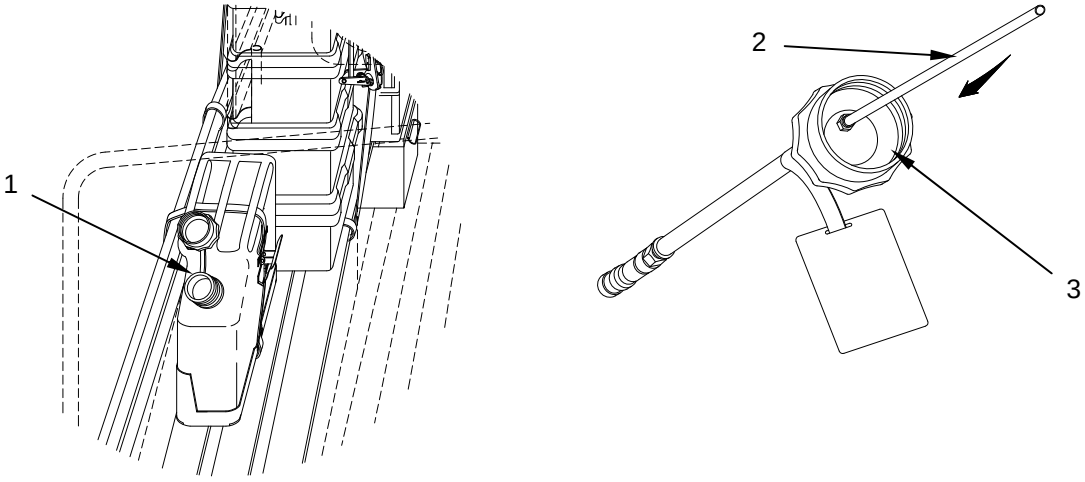


Figure 41. Fuel Can Adapter for Installation (Army Only).

c. Thread fuel can adapter onto fuel can and hand tighten.

d. Connect fuel line to fuel can adapter by pulling back on connector and threading onto fuel line. Ensure fuel flow arrow on fuel filter points in proper direction. Filter should be closer to the fuel can than TRH.

e. Turn clockwise until connector clicks into place.

INSTALLATION INSTRUCTIONS – CONTINUED

11. Install the fuel can in the fourth compartment of the trailer's left side storage rack as follows:

    a. With the fuel can balanced on the storage rack compartment, but not yet seated inside the compartment, pass a 14 -ft cargo strap through the front facing slot (Figure 42, Item 1) of the storage rack compartment, through the handle of the fuel can, and then the rear facing slot of the storage rack compartment. Adjust slack in strap so ratchet end of strap is accessible.

    b. Fit the fuel can into the storage rack compartment with the cap facing in (Figure 42, Item 2).

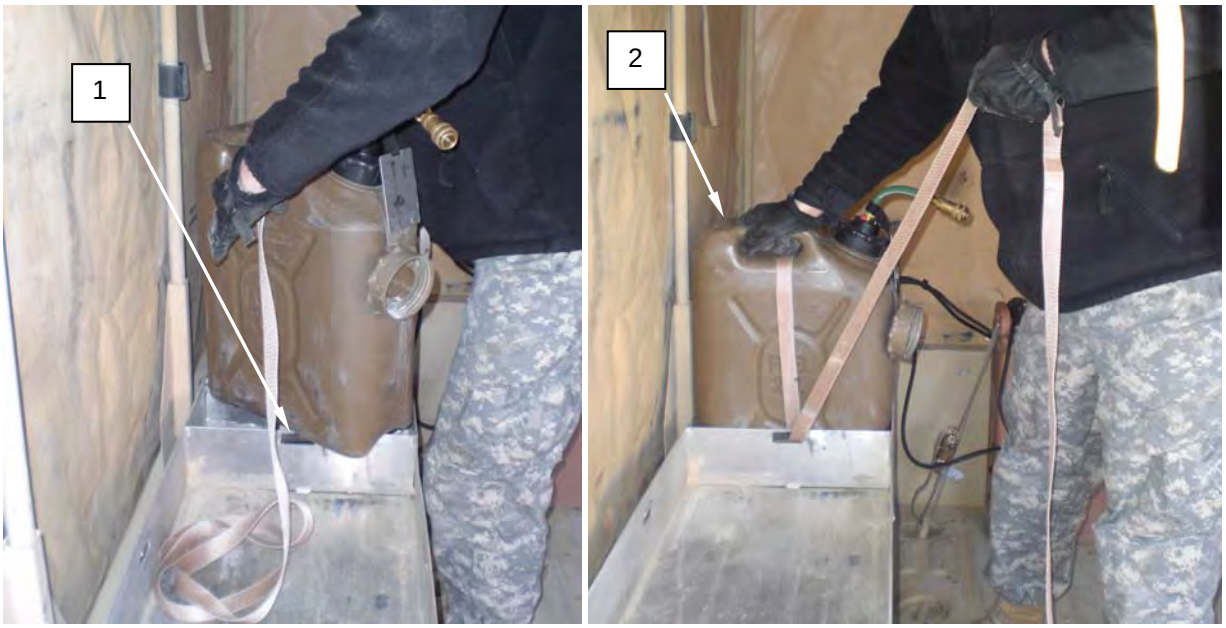


Figure 42. Fuel Can Cargo Strap Placement (Army Only).

    c. Pass the cargo strap back through the fuel can handles and ratchet (Figure 43, Item 1) on the side of the fuel can.

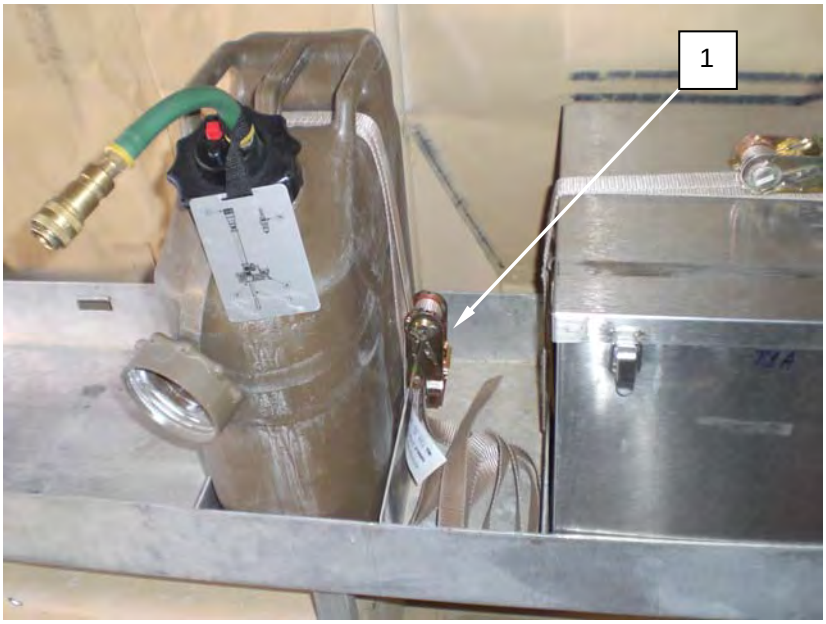


Figure 43. Fuel Can Ratchet Placement (Army Only).

INSTALLATION INSTRUCTIONS – CONTINUED

12. Install the folding tables in the rearmost compartment of the trailer's left side storage rack as follows:

    a. Using two 14 -ft cargo strap, place the ratchets between the cargo canopy and the canopy support posts to keep them out of the way (Figure 44, Item 1).

    b. Route loose ends of the cargo straps through the rear slots of the driver side storage rack (Figure 44, Item 2).

Figure 44. Folding Table Cargo Strap Placement (Army Only).

INSTALLATION INSTRUCTIONS – CONTINUED

c. Place the three folding tables in the rearmost compartment of the trailer's left side storage rack with the first two table tops facing in (Figure 45, Item 1) and the last table top facing out (Figure 45, Item 2).

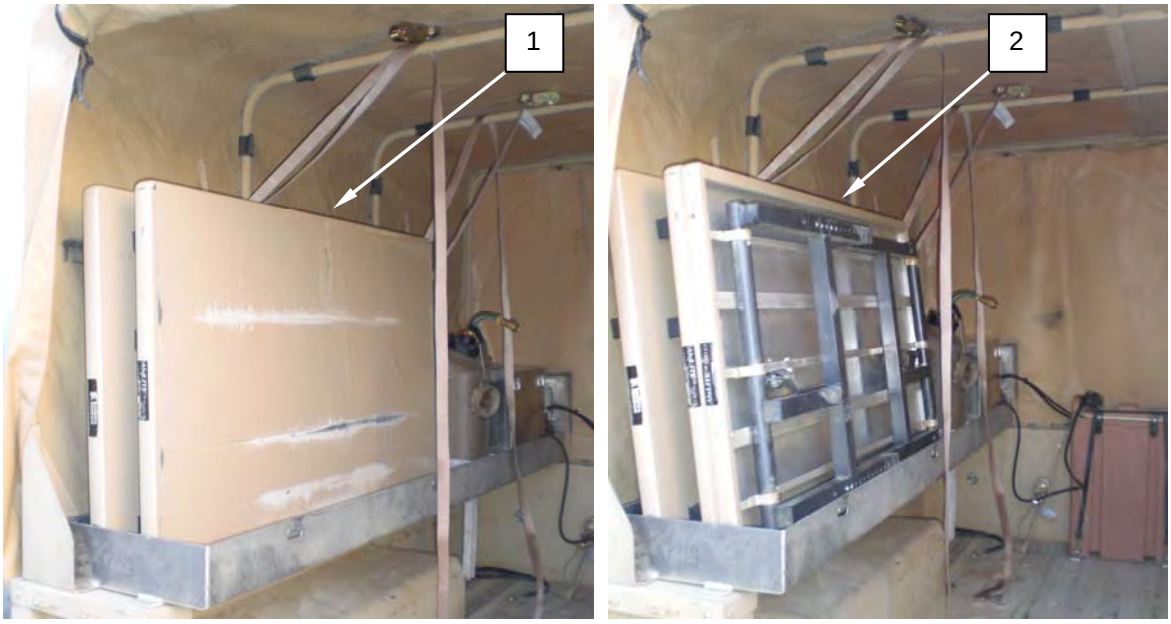


Figure 45. Folding Table Placement (Army Only).

d. Bring loose end of cargo strap around the folding tables, pass through front slots (Figure 46, Item 1) of the driver side storage rack, and ratchet on the inner side of the folding tables (Figure 46, Item 2).

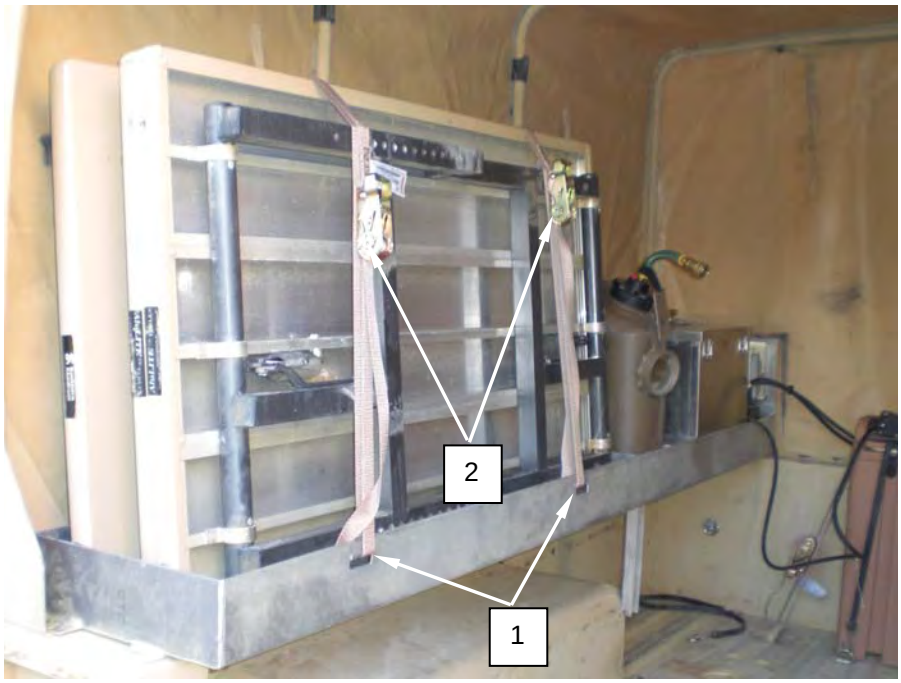


Figure 46. Securing Folding Tables with Cargo Strap (Army Only).

INSTALLATION INSTRUCTIONS – CONTINUED

13. Install the utensil kit in the trailer as follows:

    a. Place the utensil kit in the front left corner of the trailer's cargo floor and connect one end of a elastic cord from one D-ring in front of the utensil kit (Figure 47, Item 1), through the D-ring on the trailer side wall (Figure 47, Item 2).

    b. Pass the elastic cord through the utensil kit handle (Figure 47, Item 3).

    c. Connect the remaining end of the elastic cord to the other D-ring in front of the utensil kit (Figure 47, Item 2).

Figure 47. Securing Utensil Kit (Army Only).

14. Install the fire extinguisher in the trailer as follows:

    a. Remove the four bolts from the fire extinguisher bracket (Figure 48, Item 1).

Figure 48. Fire Extinguisher Bracket Placement (Army Only).

    b. Align the fire extinguisher bracket to the canopy support post.

INSTALLATION INSTRUCTIONS – CONTINUED

c. Using four bolts, washers, and nuts secure the fire extinguisher bracket to the inside of the canopy support post (Figure 49, Item 1). Tighten nuts securely.

d. Secure the fire extinguisher to the fire extinguisher bracket using the retaining arm (Figure 49, Item 2).

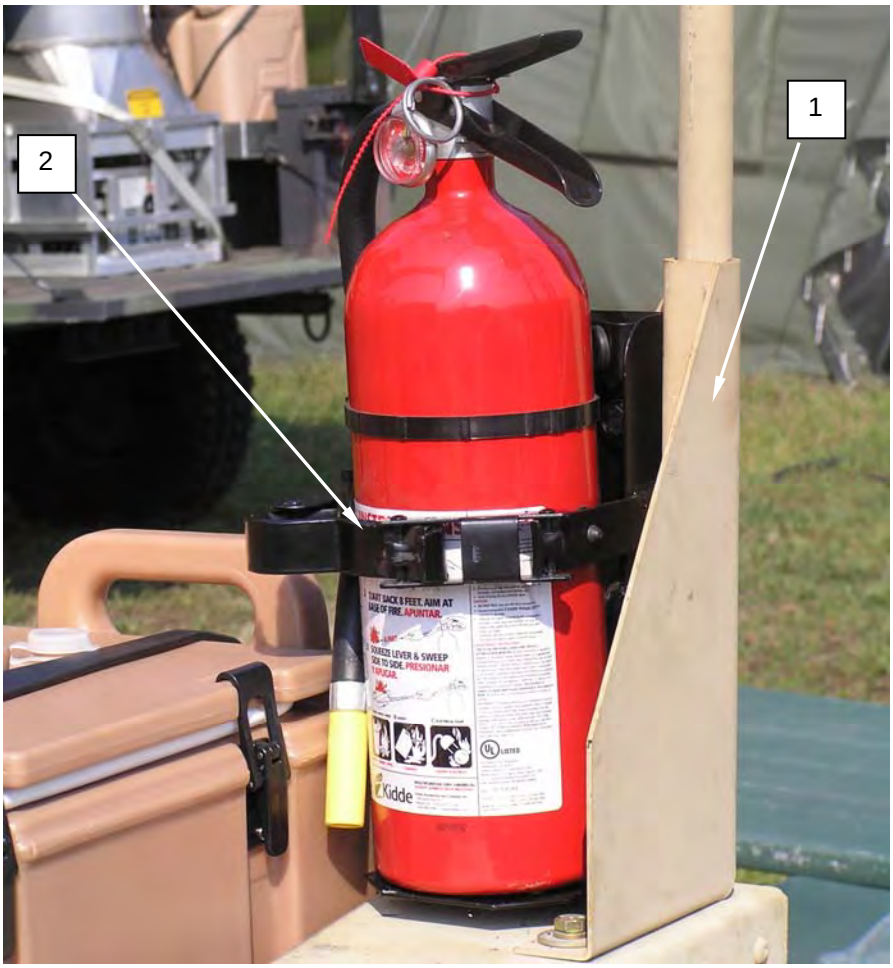


Figure 49. Securing the Fire Extinguisher (Army Only).

INSTALLATION INSTRUCTIONS – CONTINUED

15. Install Tray Ration Heater in trailer as follows:

WARNING

Ensure the TRH is empty before installing on a HMMWV or LTT. The TRH is extremely heavy when full and may cause injury to personnel who attempt to move the TRH while it is full.

CAUTION

Ensure TRH is on a wooden pallet or other support before attempting to lift with material handling equipment. Failure to observe caution may result in damage to the TRH tank or skids.

CAUTION

To secure the TRH in a vehicle, it is necessary to use cargo straps wrapped around the TRH skids. Do not over tighten the cargo strap ratchets to the point they bend the TRH skids.

a. Place Tray Ration Heater on wooden pallet or other support and lift with forklift (Figure 50, Item 1).

b. Slide Tray Ration Heater onto trailer cargo bed with exhaust vent and drain vent side (Figure 50, Item 2) facing rear of trailer. Install TRH so that TRH Tank skids slide between the ridges (Figure 50, Item 3) of the corrugated trailer floor. The skids are designed so that both skids may each be between two ridges at the same time. Ensure trailer tail gate closes without interference from the TRH tank drain valve.

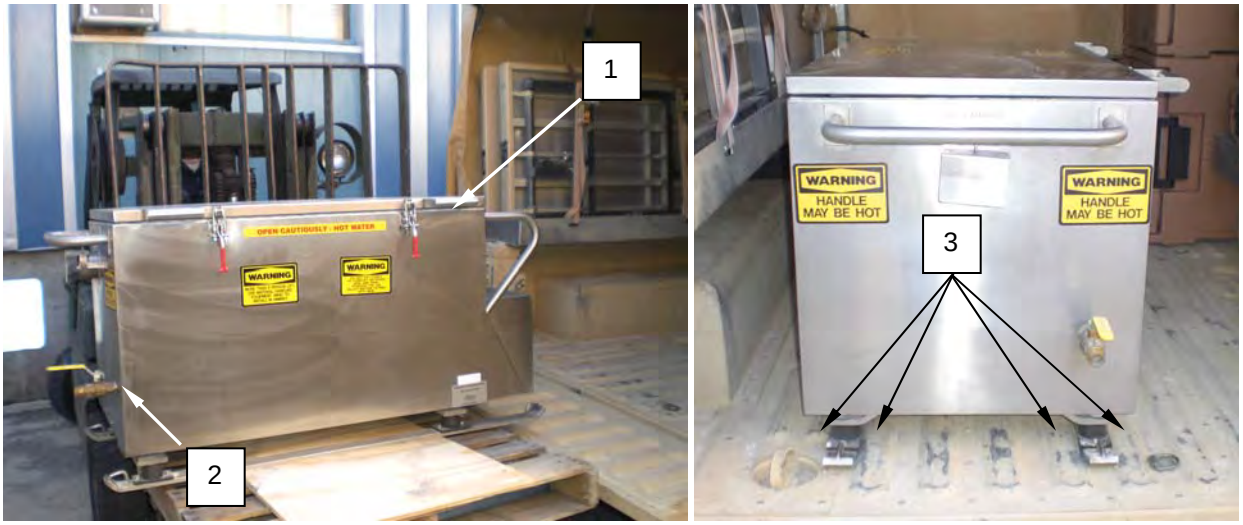


Figure 50. Loading the TRH on Trailer Bed (Army Only).

INSTALLATION INSTRUCTIONS – CONTINUED

c. Lay a 5-foot cargo strap on bed, at TRH burner side of TRH Tank, with ratchet (Figure 51, Item 1) in front of heater (Figure 51, Item 2) and strap (Figure 51, Item 3) to driver side.

d. Pass cargo strap through TRH front driver side skid ring (Figure 51, Item 4).

e. Pass cargo strap through D-ring M (Figure 51, Item 5) on driver side of cargo floor.

f. Pass cargo strap under and through D-ring N (Figure 51, Item 6) and passenger side skid ring (Figure 51, Item 7).

g. Pass cargo strap through ratchet, but do not tighten ratchet at this time.

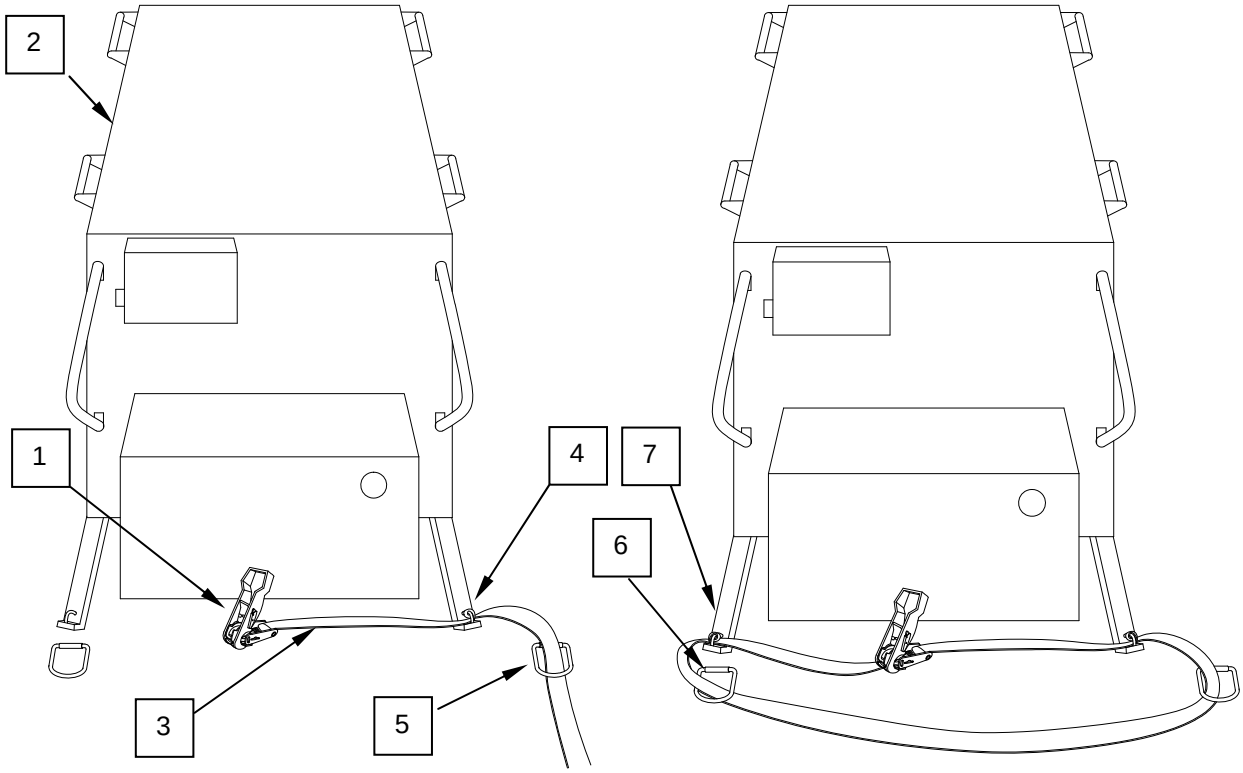


Figure 51. Tray Ration Heater Front Cargo Strap Path (Army Only).

INSTALLATION INSTRUCTIONS – CONTINUED

h. Lay a 5-foot cargo strap on bed, at drain valve side of TRH Tank, with ratchet (Figure 52, Item 1) in front of tank (Figure 52, Item 2) and strap (Figure 52, Item 3) to passenger side.

i. Pass cargo strap through TRH rear passenger side skid ring (Figure 52, Item 4).

j. Pass cargo strap over and through D-ring Q (Figure 52, Item 5).

k. Pass cargo strap under and through D-ring no. 11 (Figure 52, Item 6) and driver side skid ring (Figure 52, Item 7).

l. Pass cargo strap through ratchet but do not tighten at this time.

m. Using a second 5-foot cargo strap placed in the same manner as the previous cargo strap, pass the strap under and through D-ring Q (Figure 52, Item 5).

n. Bring cargo strap behind the skid mounts (Figure 52, Item 8) underneath the TRH water tank.

o. Pass cargo strap over and through D-ring no. 11 (Figure 52, Item 6) and ratchet in front.

p. Slide TRH over D-rings (Figure 52, Items 5 and 6) towards front of vehicle to ensure rear gate (Figure 53, Item 1) closes without interference from the drain valve (Figure 53, Item 2).

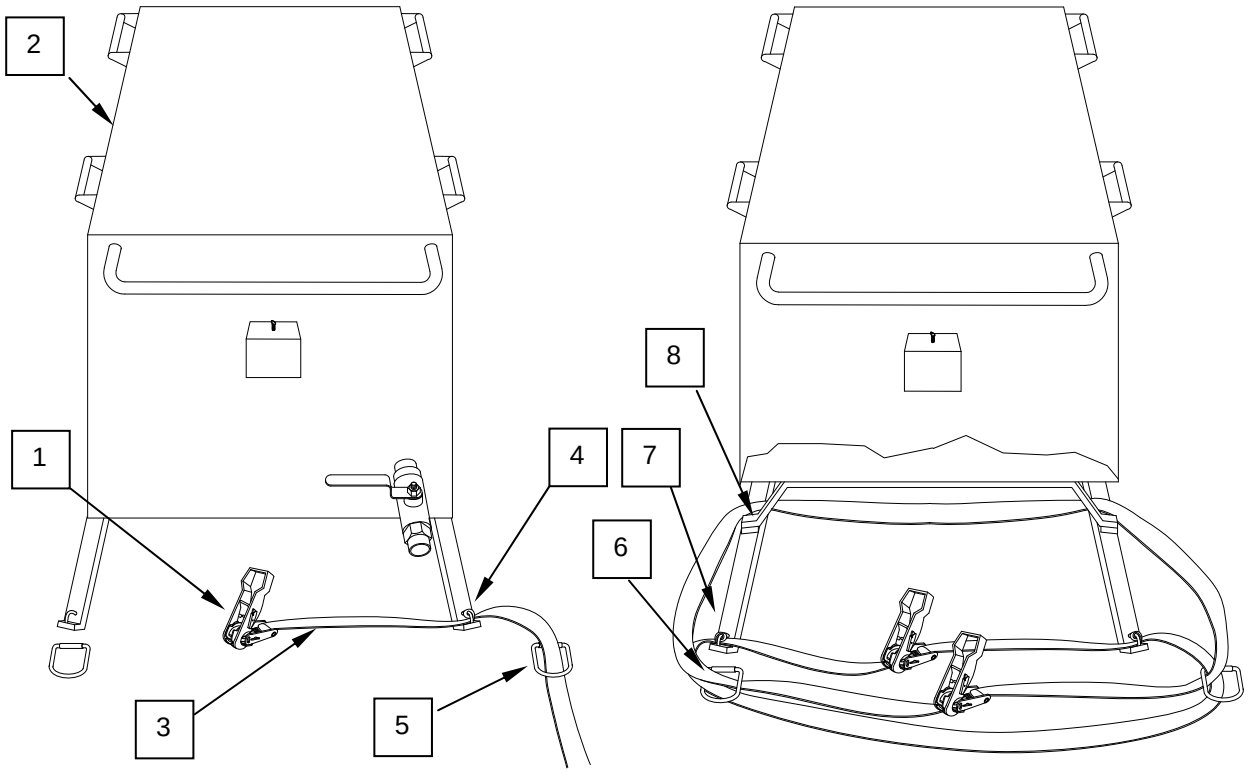


Figure 52. Tray Ration Heater Rear Cargo Strap Path (Army Only).

INSTALLATION INSTRUCTIONS – CONTINUED

CAUTION

To secure the TRH in a vehicle, it is necessary to use cargo straps wrapped around the TRH skids. Do not over tighten the cargo strap ratchets as this may bend the TRH skids.

q. Ratchet cargo straps in front and rear of TRH. Do not over tighten as TRH skids may bend.

r. Orient exhaust elbow shield (Figure 53, Item 1) downward.

Figure 53. TRH Placement (Army Only).

INSTALLATION INSTRUCTIONS – CONTINUED

WARNING

Do not attempt to connect a fuel line to the TRH in the vicinity of any open flame. Ensure that the fuel hose connections are made properly to avoid fuel spillage. Prevent a possible fire hazard by having absorbent materials or fuel mats on hand to absorb any spillage. Failure to observe safety precautions may result in injury or death to personnel.

16. Connect fuel line (Figure 54, Item 1) to fuel can and TRH using two quick disconnect fittings (Figure 54, Item 2). Fuel filter (Figure 54, Item 3) shall be closer to the fuel can than to the TRH.

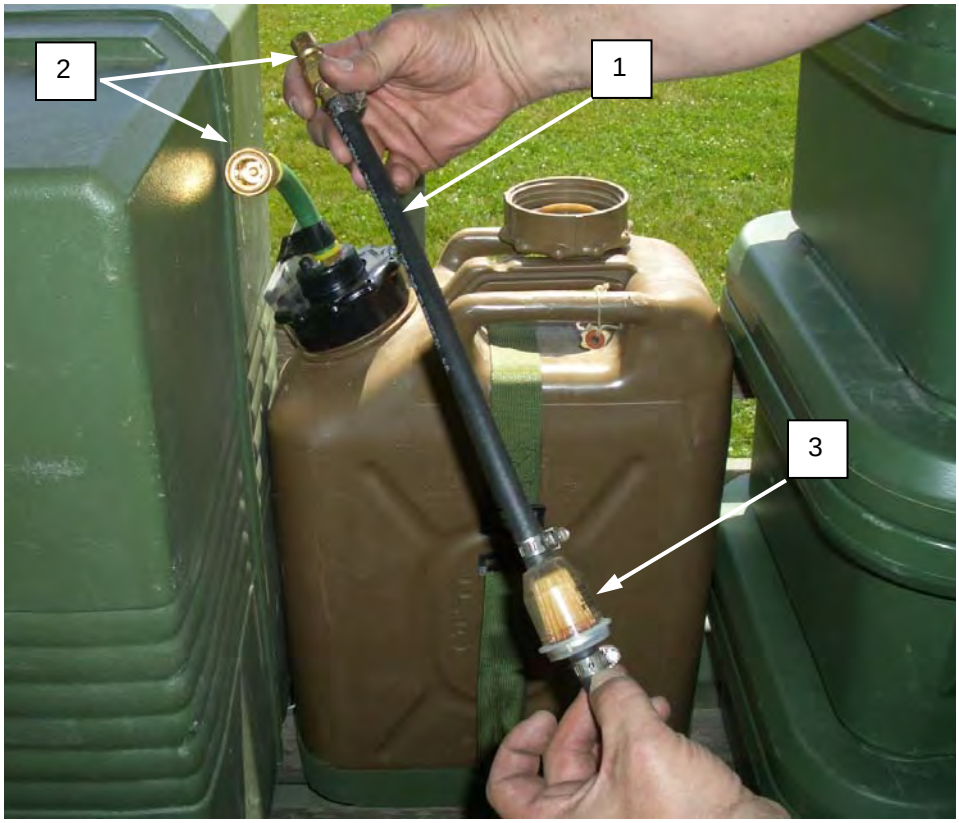


Figure 54. Fuel Line Connection (Army Only).

INSTALLATION INSTRUCTIONS – CONTINUED

17. Install Tray Ration Heater fuel line and power cord as follows:

    a. Connect TRH fuel line to fuel input (Figure 55, Item1) by pulling back connector and threading connector clockwise until a click is heard.

    b. Connect power line to TRH power input (Figure 55, Item 2).

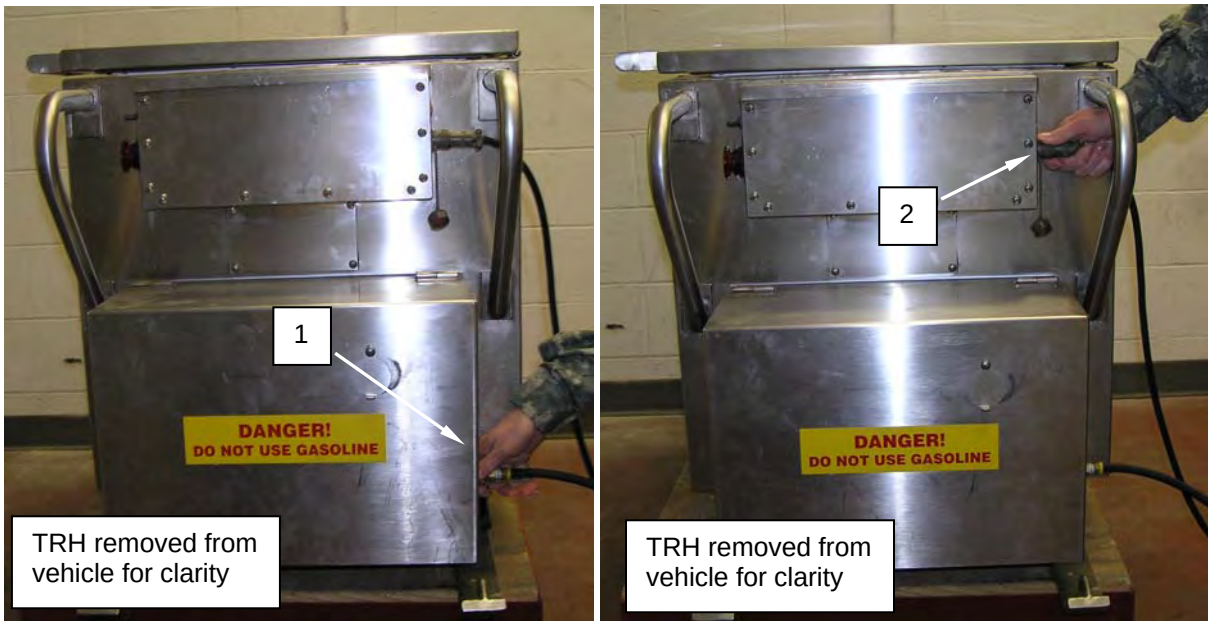


Figure 55. TRH Fuel and Power Connections (Army Only).

    c. Connect opposite end of power line to inverter outlet GFCI outlet (Figure 56, Item 1).

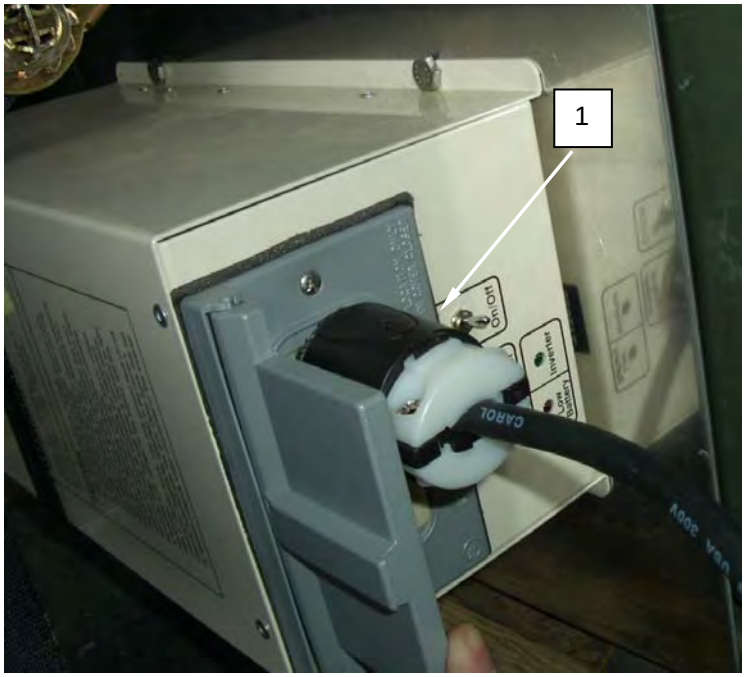


Figure 56. TRH Inverter Power Connection (Army Only).

INSTALLATION INSTRUCTIONS – CONTINUED

18. Place Tool Kit under passenger side storage rack as follows:

    a. Place Tool Kit above D-ring no. 8, between D-rings no. 6 (Figure 57, Item 1) and 10 (Figure 57, Item 2).

    b. Connect one end of a elastic cord to D-ring no. 6 (Figure 57, Item 1).

    c. Pass free end of elastic cord through Tool Kit handle (Figure 57, Item 3) and attach to D-ring no. 10 (Figure 57, Item 2).

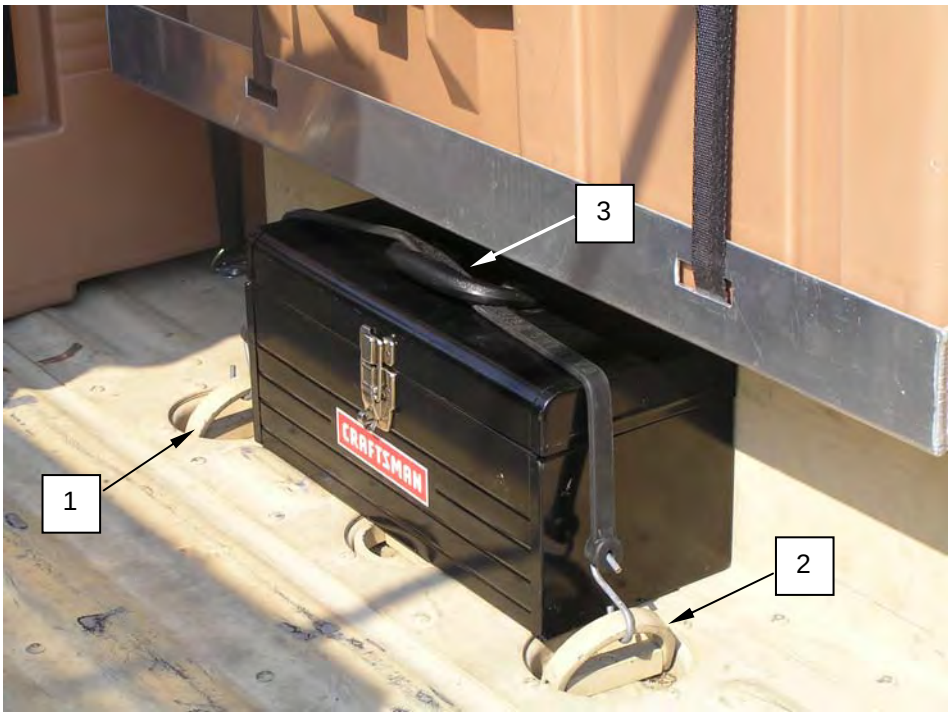


Figure 57. Tool Kit Placement (Army Only).

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE

SERVICE UPON RECEIPT (MARINE CORPS ONLY)

INITIAL SETUP:

Tools and Special Tools

Maintenance Kit (WP 0066, Item 1)
Tool Kit (WP 0066, Item 3)

Personnel Required

Food Service Technician 3381 (2)

References

TB 10-7360-230-23

SERVICE UPON RECEIPT

INSTALLATION INSTRUCTIONS

The TRHS can be easily and safely installed in a matter of minutes. All components can be installed without material handling equipment. The following paragraphs detail the installation of the TRH, the TRH fuel supply system and the inverter.

INSTALLATION INSTRUCTIONS - CONTINUED

WARNING

Use the 90-degree exhaust elbow over the exhaust pipe to angle hot exhaust down and away from PERSONNEL AND EQUIPMENT.

WARNING

6 persons must be used to move the TRH, lifting with legs, not back, to prevent injury. Do not use the lid handles to move the TRH. If using personnel to move the TRH, use the two lift bars on the TRH.

CAUTION

DO NOT use the lid handle as a lifting device for the TRH as it will result in equipment damage.

Tray Ration Heater

1. Place HMMWV tailgate in down position. Position TRH (without water) so that the TRH Burner end will enter the HMMWV first. Using four-man lift, place the TRH by its side handles into the HMMWV, taking care to keep the TRH relatively level so fuel will not run out of the TRH Burner. The skids on the bottom of the TRH will fit into the grooves on the cargo bed of the HMMWV. It may be necessary to move the TRH slightly from side to side so that it aligns with the cargo bed corrugated grooves. Line up the TRH skid rings with the D-rings on the left side of the HMMWV cargo bed (Figure 1).

2. Install the two tie down straps by looping them through the D-rings attached to the HMMWV cargo bed and the TRH skid rings. Snug the TRH to the bed of the HMMWV using the strap ratchet, but DO NOT over tighten. (Note: TRH may have to be lifted in order to install tie down straps through D-rings)

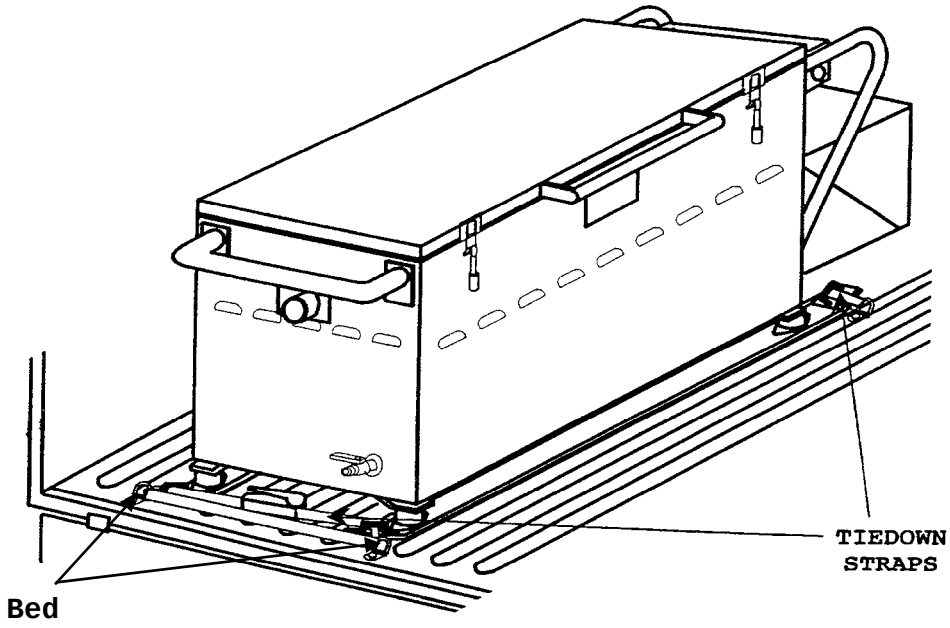


Figure 1. TRH Stabilizing Devices (Cargo Bed Rings/Tiedown Strap Positioning) (Marine Corps Only).

INSTALLATION INSTRUCTIONS - CONTINUED

WARNING

Gasoline should **NOT** be used with the TRH under any circumstance. **Only JP-8 or an approved alternate diesel fuel may be used.** Using gasoline in the TRH will create a fire danger and potential for explosion. Failure to observe safety precautions may result in injury or death to personnel.

Fuel Can

1. Install the fuel can bracket directly behind the driver's seat. The fuel can must be positioned in the HMMWV as shown in Figure 2.

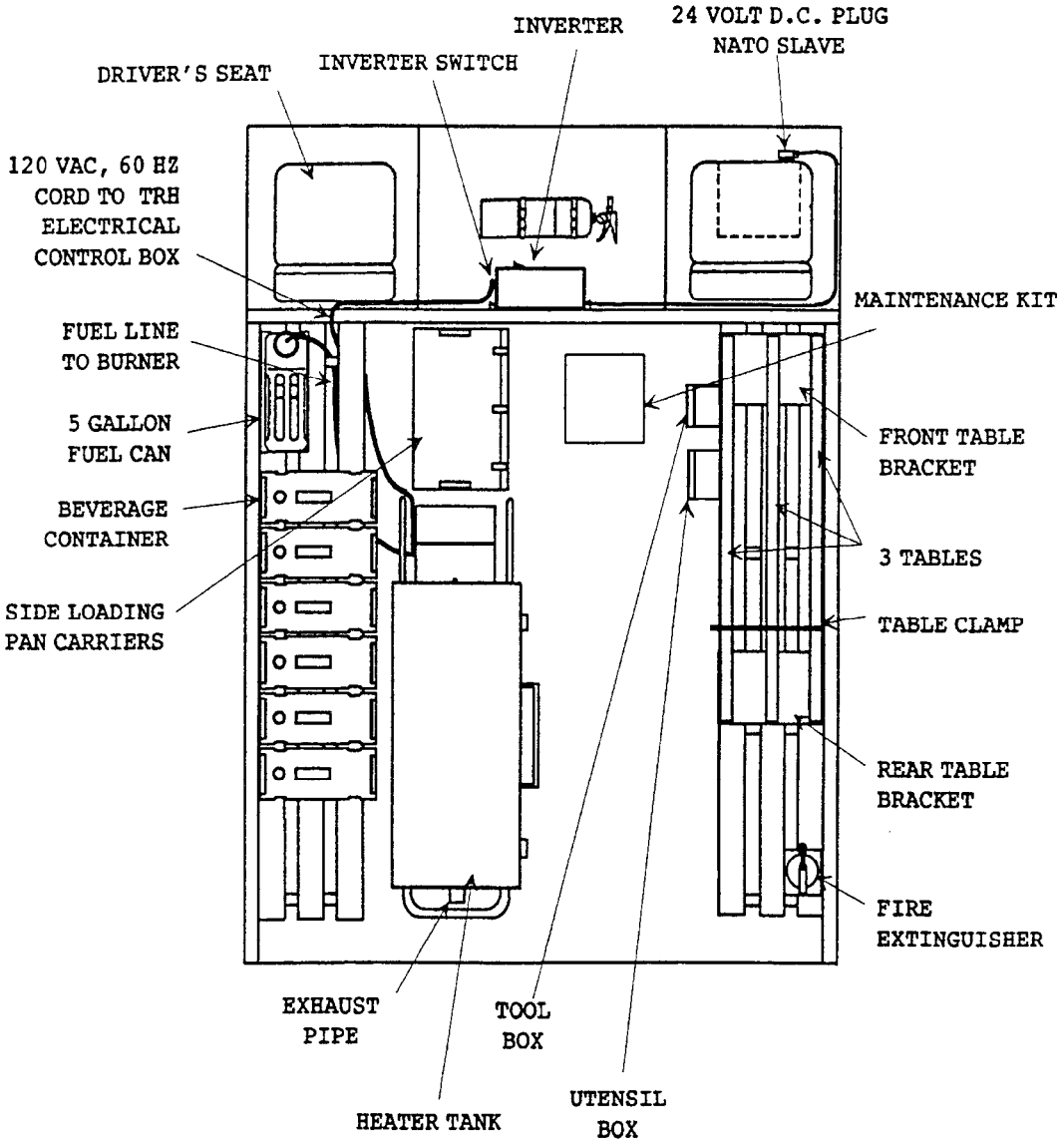


Figure 2. Marine Corps Pack Plan (Marine Corps Only).

INSTALLATION INSTRUCTIONS – CONTINUED

WARNING

Fill fuel cans before placing in HMMWV. Failure to observe safety precautions while refueling may cause severe fire hazards resulting in injury or death to personnel.

2. Place a fuel can, filled with appropriate fuel, (DO NOT fill can while in HMMWV) in the bracket and secure as shown in Figure 3. Run the securing strap in back of the can and in back of the boards of the troop seat, go through fuel can handle. DO NOT run strap over the top of the can handles. Fasten the strap and tighten securely.

3. After the fuel can is in place and secure, ensure plastic dip tube is attached to the fuel can cap and connect the TRH Burner fuel line to the can using the adapter. The Fuel Can Adapter (Figure 3) with flexible probe attached, screws onto the top of the fuel can. The male metal fitting on the fuel line snaps into the female fitting on the feed line of the fuel can adapter. The other end of the fuel line fits the fitting at the TRH Burner cover. The vent screw on top of the fuel can adapter must be opened slightly to vent the fuel can so that the fuel pump in the TRH Burner will draw fuel from the can properly. Ensure the fuel line connector “clicks” when attached to the fitting at the TRH Burner cover and fuel can.

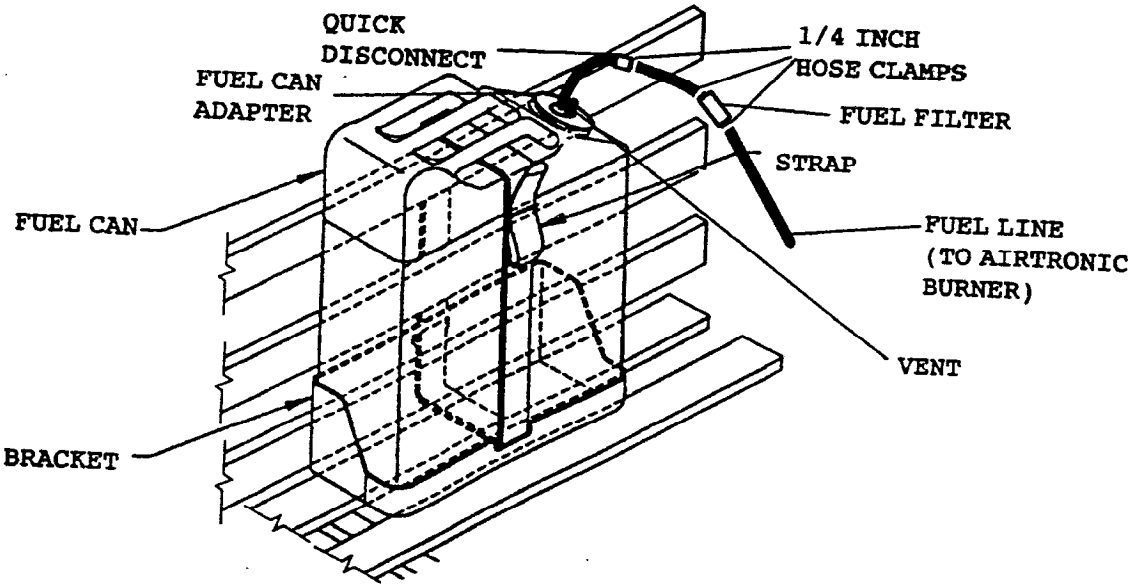


Figure 3. Securing the Fuel Can (Marine Corps Only).

INSTALLATION INSTRUCTIONS – CONTINUED

Table Brackets, Clamp, and Tables

1. Install front and rear table brackets on the right hand seat of the HMMWV as shown in Figure 4. A square tubing guide on the bottom of each bracket fits between the wooden troop seat slats. The rear bracket (closest to the tailgate) is placed on the seat and moved back until it hits the seat frame. The front bracket is placed on the seat so that the tab on the side fits into the seat frame.

2. Install tables with legs facing inboard to prevent snagging of clothing or equipment (Figure 4).

3. Install the table clamp assembly in the location shown in Figure 4. Fit the metal bracket end of the assembly around the top wooden back support of the seat. Place the upright part around the tubular support for the HMMWV canvas top. Insert the quick release pins behind the upright tubing to complete installation.

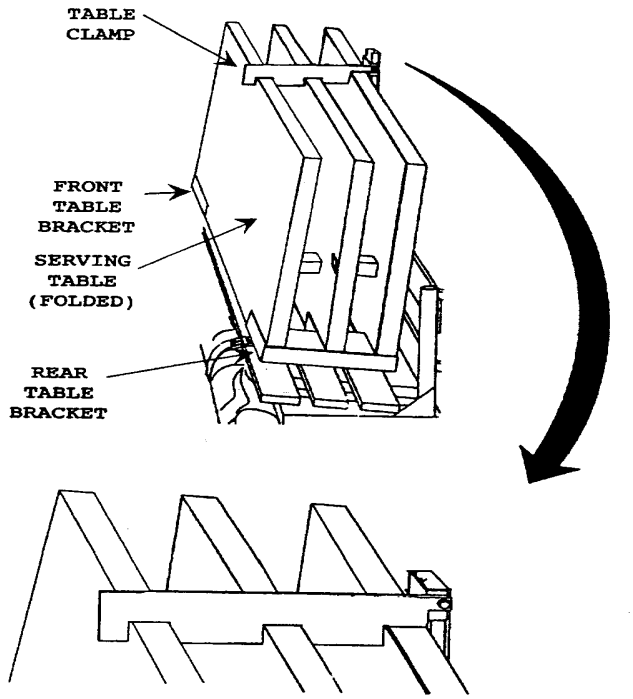


Figure 4. Securing Tables In HMMWV (Marine Corps Only).

Inverter Assembly

CAUTION

DO NOT turn on power until procedure to fill heater tank with water is complete.

CAUTION

Make sure all inverter and tank switches are in the OFF position.

1. Fit the metal bracket with attached inverter assembly over the middle of the panel that runs behind the driver and passenger seats. The inverter box should remain inside the cab.

2. Plug in the cable to HMMWV NATO receptacle under the front of the passenger seat (Figure 2).

INSTALLATION INSTRUCTIONS – CONTINUED

3. Plug in the cord from the TRH electrical control box to the inverter receptacle outlet to send power to the TRH. Ensure reset button on RFI receptacle (Figure 5, Item 1) has not been tripped. Turn on the Power switch (Figure 5, Item 2) located on the front of the inverter to allow flow of 120 VAC 60 HZ to the outlet on the receptacle as shown in Figure 5. The green LED indicator (Figure 5, Item 3) will illuminate if current is flowing through the inverter. If vehicle battery is low, a red indicator (Figure 5, Item 4) will light up on electrical control box. In that case, start vehicle to supply power to run TRHS.

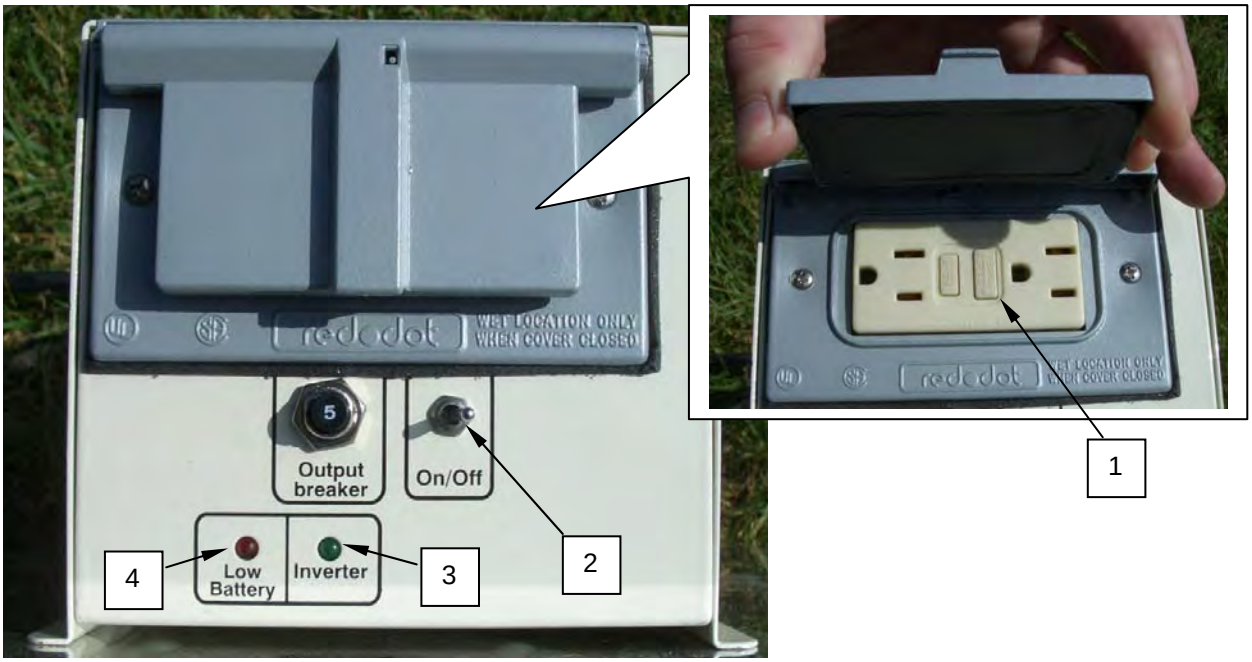


Figure 5. Inverter Assembly (Marine Corps Only).

Side Loading Pan Carriers

Stack the three side loading pan carriers behind the TRH (Figure 2) and secure to HMMWV D-ring via ratchet-operated strap. It may be necessary to fasten the short strap adapter to a D-Ring and run the tie down strap through the strap adapter as all HMMWV are not configured the same.

Beverage Containers

Mount the six, 5-gallon beverage containers on the troop seat next to the TRH (Figure 2) and secure to seat with a ratchet-operated strap slung over the containers and under the seat-support slats.

Fire Extinguisher

Mount the fire extinguisher/bracket (Figure 2) to an upright troop-seat slat, behind the tables, by inserting the bracket quick-release pin behind the slat.

Tool Box, Utensil Box and Maintenance Kit

Place these items on the deck of the HMMWV as shown in Figure 2.

END OF TASK

END OF WORK PACKAGE

OPERATOR AND FIELD MAINTENANCE

PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) INTRODUCTION

GENERAL

The following information describes PMCS procedures for the Assault Kitchen (AK). The PMCS table has been provided to ensure the Assault Kitchen (AK) is in proper operating condition, and ready for use.

SCOPE

The following work package (WP 0016) contains maintenance procedures that are authorized by the Maintenance Allocation Chart (MAC), and the Source, Maintenance, and Recoverability (SMR) coded items that are identified in the Repair Parts and Special Tools List (RPSTL).

MAINTENANCE FUNCTIONS/PROCEDURES

The work packages above identify maintenance functions specified in the MAC. All maintenance procedures required to complete a maintenance function are identified under PROCEDURE: in the order in which the work is most logically accomplished.

INTRODUCTION

Preventive Maintenance Checks and Services (PMCS) are performed to keep the Assault Kitchen (AK) in good operating condition and ready for its primary mission. The checks are used to find, correct, and report problems. PMCS is performed every day the Assault Kitchen (AK) is in operation, and is done according to the PMCS table provided. Pay attention to **WARNING**, **CAUTION**, and **NOTE** statements. A **WARNING** indicates that someone could be hurt or killed. A **CAUTION** indicates that equipment could be damaged. A **NOTE** may make your maintenance or repair task easier.

Be sure to perform scheduled PMCS. Always perform PMCS in the same order so it becomes habit. With practice, you will quickly recognize problems with the equipment.

Use DA Form 2404 or DA Form 5998, Equipment Inspection and Maintenance Worksheet, to record any discovered faults. Do not record faults that you fix.

PMCS PROCEDURES

WP 0018, Table 1 lists inspections and care required to keep your equipment in good operating condition. It is arranged so that you can perform before operation checks as you walk around the equipment.

Explanation of Table 1 Columns

Item Number. Indicates the reference number. When completing DA Form 2404 or DA Form 5998, Equipment Inspection and Maintenance Worksheet, include the item number for the item to check/service indicating a fault. Item numbers appear in the order you must perform the checks/services listed.

Interval. Indicates when you must perform the procedure in the procedure column.

before - perform before equipment operation
during - perform during equipment operation
after - perform after equipment has been operated
weekly - perform every week
monthly - perform each month
hours - perform at the noted hourly interval

PMCS PROCEDURES - CONTINUED

Item to Check/Service. Indicates the item to be checked or serviced.

Procedure. Indicates the procedure you must perform on the item listed in Item to Check/Service column. You must perform the procedure at the time specified in the Interval column.

Not Fully Mission Capable If:. Indicates faults that will prevent your equipment from performing its primary mission. If you perform procedures listed in Procedure column that show faults listed in this column, do not operate the equipment. Follow standard procedures for maintaining the equipment or reporting equipment failure.

Other Special Entries. Observe all special information and notes that appear in Table 1.

When a check/service procedure is required for both weekly and before intervals, it is not necessary to perform the procedure twice if the equipment is operated during the weekly period.

END OF WORK PACKAGE

OPERATOR AND FIELD MAINTENANCE

PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) PROCEDURES

INITIAL SETUP:

References

DA PAM 750-8
TB 43-0002-43

Personnel Required

Food Service Specialist 92G (1)
Food Service Technician 3381 (1)

Materials/Parts

Penetrating Oil (WP 0065, Item 11)

Table 1. Preventive Maintenance Checks and Services for Assault Kitchen.

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
1	Before/ Daily	TRH Burner Assembly	1. Remove cover and visually inspect TRH Burner for damage. 2. Inspect TRH Burner housing for evidence of fuel leaks. 3. Check TRH Burner electrical control box (Figure 1, Item 1) for damage and secure installation. 4. Visually inspect TRH Burner for loose wire connections (Figure 1, Item 2). 5. Check photocell to ensure it is fully inserted into the photocell base (Figure 1, Item 3). 6. Check electrical system connection from TRH Burner to TRH Tank to ensure proper connections.	Damage is present which might prevent proper burner operation. Fuel leaks in TRH Burner housing. Components are loose or not properly installed. Burner electrical connections are loose or improperly installed. Photocell is incorrectly installed.

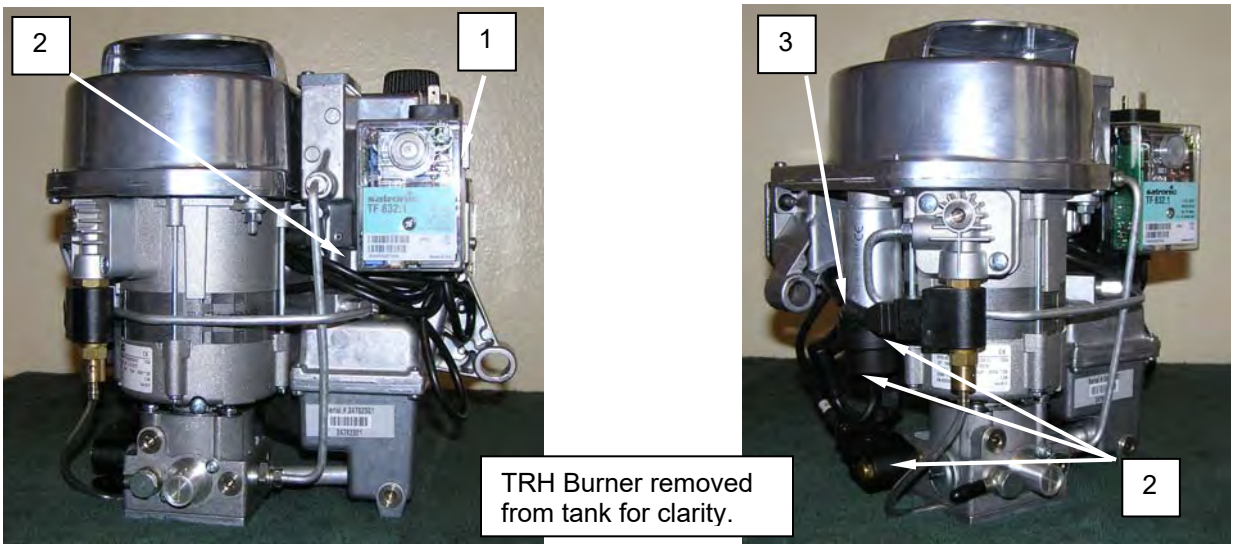


Figure 1. PMCS of TRH Burner Assembly.

Table 1. Preventive Maintenance Checks and Services for Assault Kitchen - Continued.

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
2	Before/ Daily	Tray Ration Heater (TRH) Tank	1. Check tank for water leaks. 2. Inspect exterior of TRH for cleanliness. 3. Inspect TRH tank lid and latches (Figure 2, Item 1) for serviceability. 4. Inspect TRH tank lid gasket (Figure 2, Item 2) for dirt, tears, rips or mold/mildew. 5. Ensure the pressure relief port (Figure 2, Item 3), located on inside of TRH lid and between the hinges on the outside of TRH lid, is clean and free of obstructions. 6. Inspect TRH Tank exhaust elbow (Figure 2, Item 4) for proper orientation. 7. Inspect TRH Tank skids (Figure 2, Item 5) and shock mounts (Figure 2, Item 6) for damage. 8. Inspect TRH Tank drain valve (Figure 2, Item 7) for clogs or damage.	Damage is present which may prevent proper heater operation. Water leaks from water tank. Water tank is dirty, corroded, or encrusted with mineral deposits. Lid does not seal properly or leaks. Lid gasket is dirty, moldy, damaged or corroded. Pressure relief port is dirty or obstructed. Damage to the TRH Tank skids or shock mounts that would make the TRH Tank support unstable. Obstructions in the TRH Tank exhaust elbow or drain valve. TRH Tank drain valve damaged or leaking.

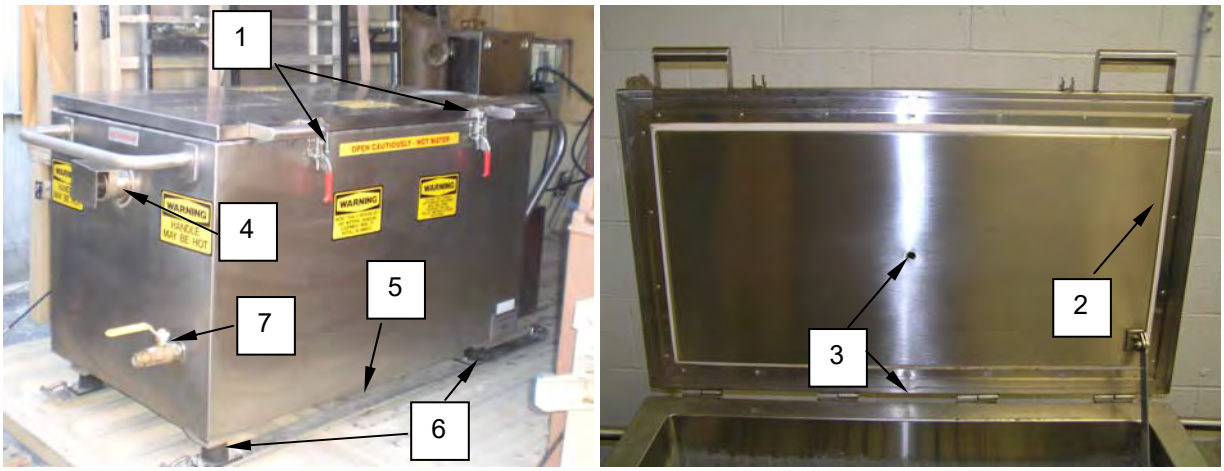


Figure 2. PMCS of TRH Tank.

Table 1. Preventive Maintenance Checks and Services for Assault Kitchen - Continued.

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
2	Before/ Daily	Tray Ration Heater (TRH) Tank - Continued	9. Check tray pack rack (Figure 3, Item 1) for broken welds. 10. Clean tip of low water sensor probe (Figure 3, Item 2).	Tray pack rack is broken or bent. Low water sensor probe is dirty, corroded, or encrusted with mineral deposits.
3	Before/ Daily	Fuel System, TRH	1. Check fuel can fuel level, refill as necessary. 2. Inspect fuel line (Figure 3, Item 3) for leaks. 3. Inspect fuel filters for damage or excessively dirty filter. One filter is located on the TRH fuel line (Figure 3, Item 4) and one filter is located in the TRH Burner housing (Figure 3, Item 5). 4. Check fuel can adapter (Figure 3, Item 6) for proper installation.	Fuel can is empty, damaged, or leaks. Fuel line is damaged, leaks, or is clogged. Fuel filter is clogged or damaged. Fuel can adapter is damaged, clogged, or improperly installed.

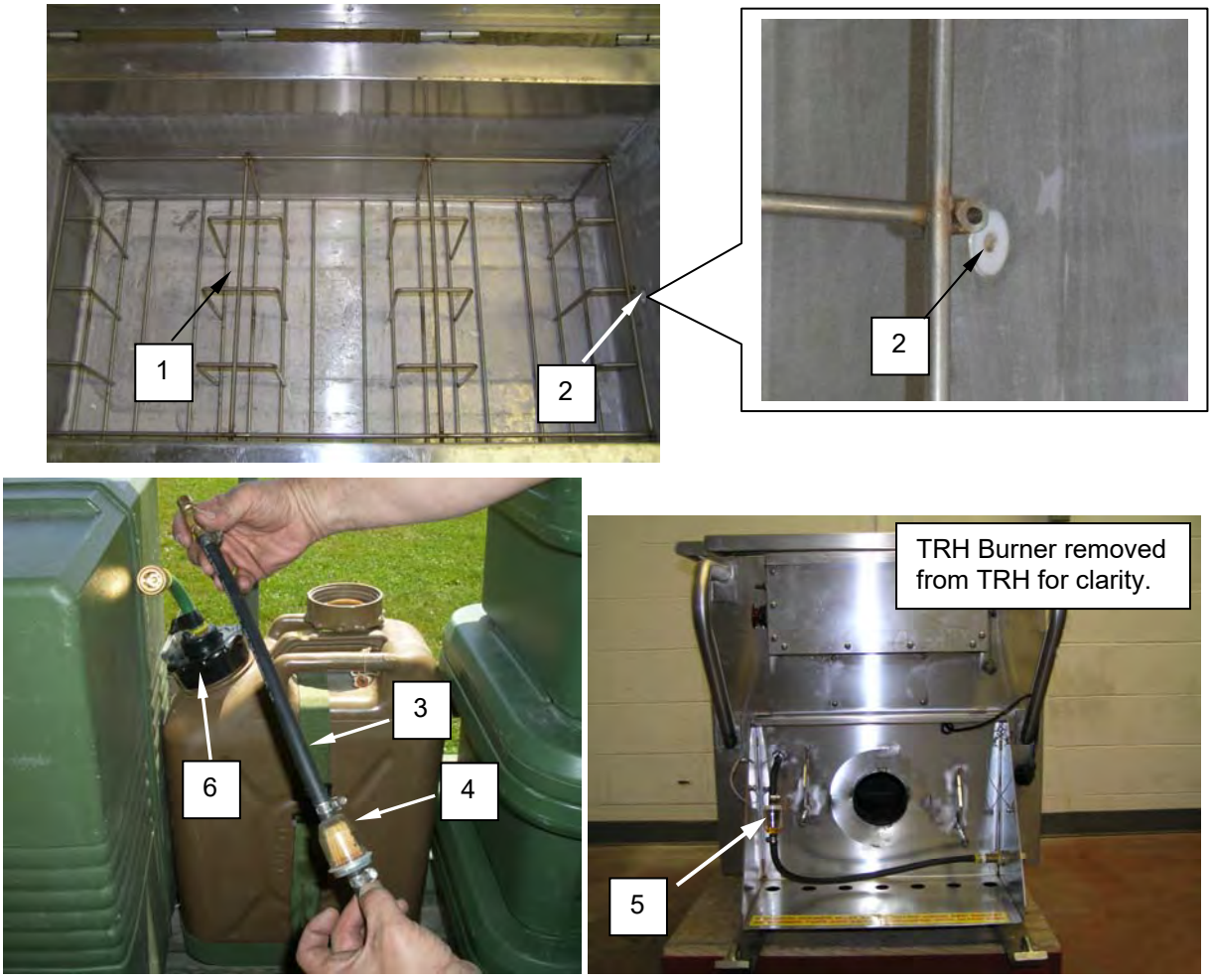


Figure 3. PMCS of AK Fuel and Electrical Systems.

Table 1. Preventive Maintenance Checks and Services for Assault Kitchen - Continued.

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
4	Before/ Daily	Electrical System, TRH	1. Inspect the Power Inverter (Figure 4, Item 1) for damage or loose installation. 2. Inspect electrical connections for secure installation from TRH tank to inverter and inverter to vehicle including NATO plug, if equipped.	Damage is present to prevent the use of the inverter. Inverter or NATO plug connections are dirty, damaged, or clogged. TRH power line is damaged or improperly installed.
5	Before/ Daily	Utensils, Food Service	1. Inventory items (WP 0002,Table 6). 2. Inspect utensils for cleanliness and serviceability.	Food service utensils required for service are missing. Damage is present to prevent proper use of utensils. Utensils are dirty, corroded, damaged, or missing.
6	Before/ Daily	Containers, Food Service	1. Inspect insulated food containers (Figure 4, Item 2) for damage and cleanliness. 2. Inspect side loading pan carrier (Figure 4, Item 3) for damage and cleanliness. 3. Inspect insulated beverage dispensers (Figure 4, Item 4) for damage and cleanliness. 4. Inspect ice chest (Figure 4, Item 5) for damage and cleanliness.	Damage is present to prevent proper use of food or beverage containers. Containers are dirty, corroded, damaged, or leaking.
7	Before/ Daily	TRH Tank Water	Check condition of tank water.	TRH Tank water is dirty, discolored, contains food particles or residue.
8	Before/ After	Tables, Folding	Inspect folding tables for cleanliness and serviceability.	Tables are dirty or corroded. Tables will not properly operate.

Figure 4. PMCS of TRH Power Inverter.

Table 1. Preventive Maintenance Checks and Services for Assault Kitchen - Continued.

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
9	Before/ After	Mounting Brackets, Cargo Straps, and Rubber Straps	1. Check all cargo straps and ratchets for tightness or damage. 2. Check all mounting brackets for secure installation.	Cargo straps are loose, frayed, or damaged. Cargo strap ratchets are loose or damaged. Tray brackets are loose.
10	During	TRH	Observe TRH Tank exhaust (Figure 5, Item 1) for excess smoke and/or fuel mist. Troubleshoot IAW WP 0010.	Excess smoke and/or fuel mist emitted from TRH tank exhaust.
11	Weekly	Tray Ration Heater (TRH)	Water tank is clean, dry and empty when not in service or clean and properly filled with clean water when in service.	Water tank is dirty, corroded, or encrusted with mineral deposits.
12	Weekly	Tables, Serving	Lubricate table hinges with penetrating oil.	Damage or corrosion is present to prevent proper deployment of tables.
13	Weekly	Fire Extinguisher	Inspect Fire extinguisher for proper charge and presence of seal.	Damage to the fire extinguisher. Fire extinguisher not properly charged.
14	Weekly	Rain Canopy (If equipped)	Inspect Rain Canopy serviceability.	Damage is present to prevent the proper deployment or use of the rain canopy. Rain canopy is dirty, torn, or leaking.

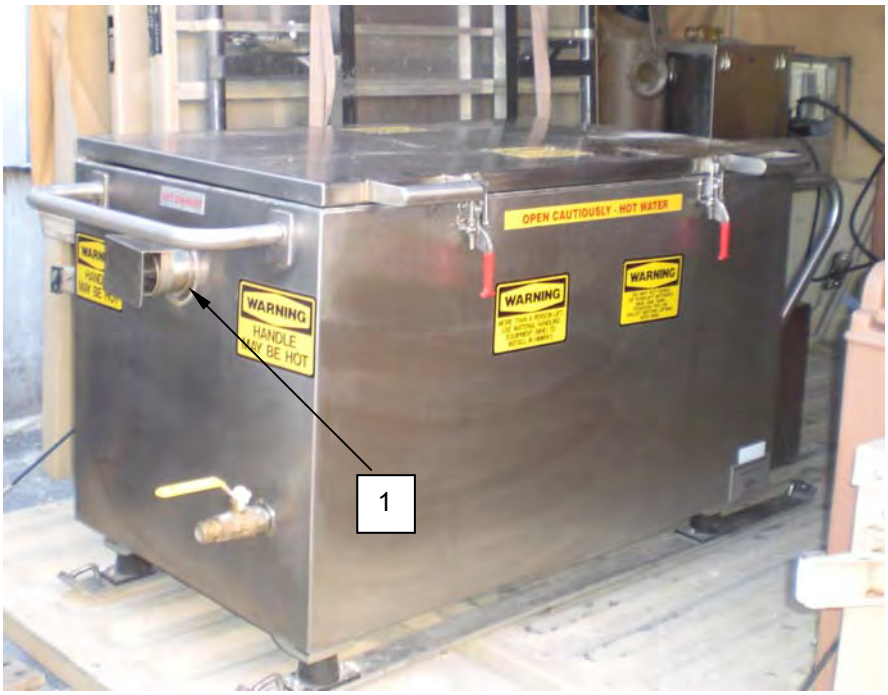


Figure 5. PMCS of TRH.

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
15	Before/ After	Maintenance and Tool Kits	1. Inventory Tool Kit (Figure 6, Item 1) IAW WP 0002, Table 5 (Army Only) or Table 15 (Marine Corps Only). 2. Inventory Maintenance Kit (Figure 6, Item 2) IAW WP 0002, Table 7 (Army Only) or Table 16 Marine Corps Only).	Tools, test equipment, or tool chests missing, damaged, or otherwise unserviceable. Maintenance kit expendables and spares missing, damaged, or otherwise unserviceable.
16	Before/ After	Stockpot Cradle Assembly	Inspect the stockpot cradle assembly (Figure 6, Item 3), including associated pots and lids.	Equipment missing, damaged or otherwise unserviceable.
17	Before/ After	MBU	Ensure MBU (Figure 6, Item 4) has been operated and maintained IAW 10-7310-281-13&P.	MBU missing, damaged, or otherwise unserviceable.

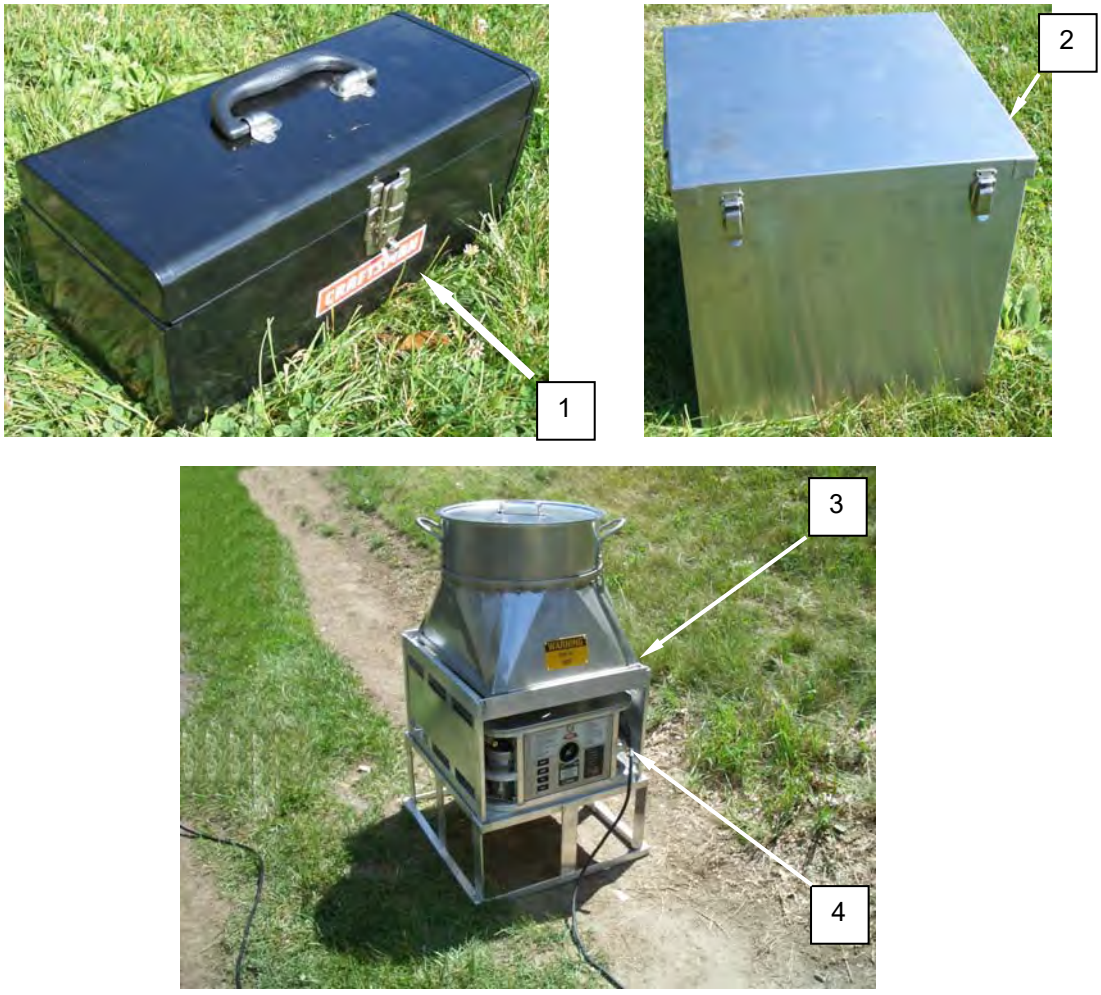


Figure 6. PMCS of Tool Kit, Maintenance Kit, Stockpot Cradle Assembly, and MBU.

END OF WORK PACKAGE

OPERATOR MAINTENANCE

ASSEMBLY, TANK
REPAIR

INITIAL SETUP:

Personnel Required	Equipment Condition
Food Service Specialist 92G Food Service Technician 3381	TRH turned OFF

REPAIR

Repair of the TRH Tank consists of replacing the wire rope assembly and pin lock.

Replacing the Wire Rope Assembly

1. Remove pin lock (Figure 1, Item 1) from saddle pin inside TRH Burner alignment and retaining pin.
2. Remove pin lock (Figure 1, Item 1) from wire rope assembly (Figure 1, Item 2) by sliding pin lock through wire rope assembly eyelet (Figure 1, Item 3).

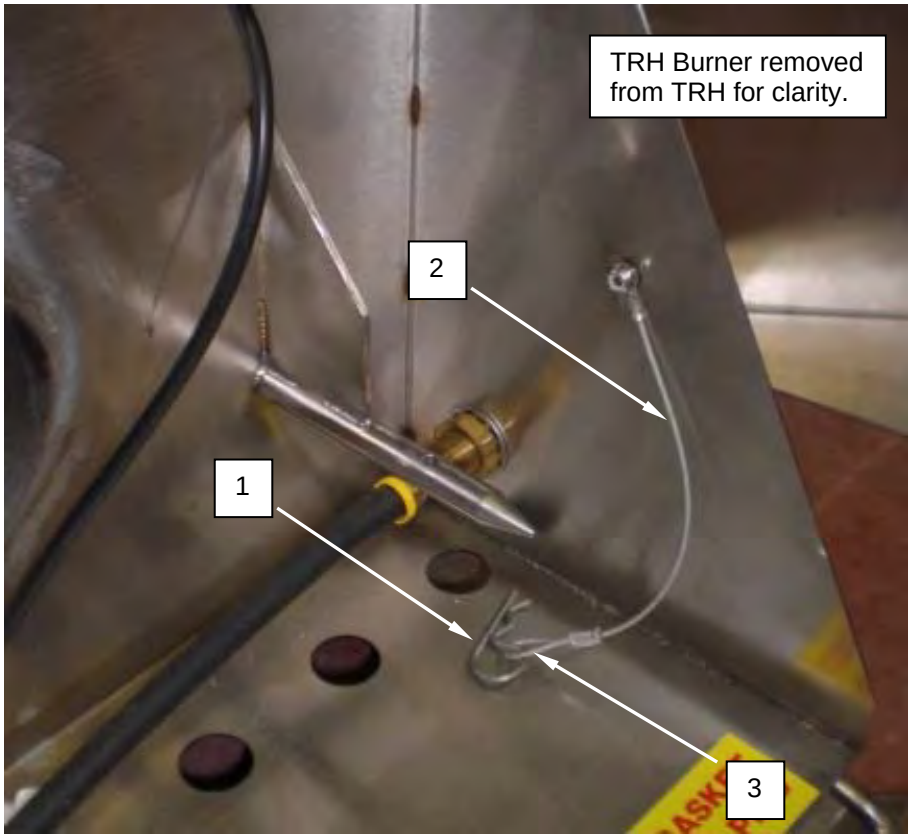


Figure 1. Pin Lock Removal.

REPAIR - CONTINUED

3. If the pin lock is not damaged, retain it for use with the replacement wire rope assembly.
4. Remove wire rope retaining nut (Figure 2, Item 1) from inside of TRH Burner housing on TRH Tank.
5. Remove wire rope (Figure 2, Item 2) and replace with serviceable part from stock.
6. Install wire rope retaining nut (Figure 2, item 1) and tighten securely.

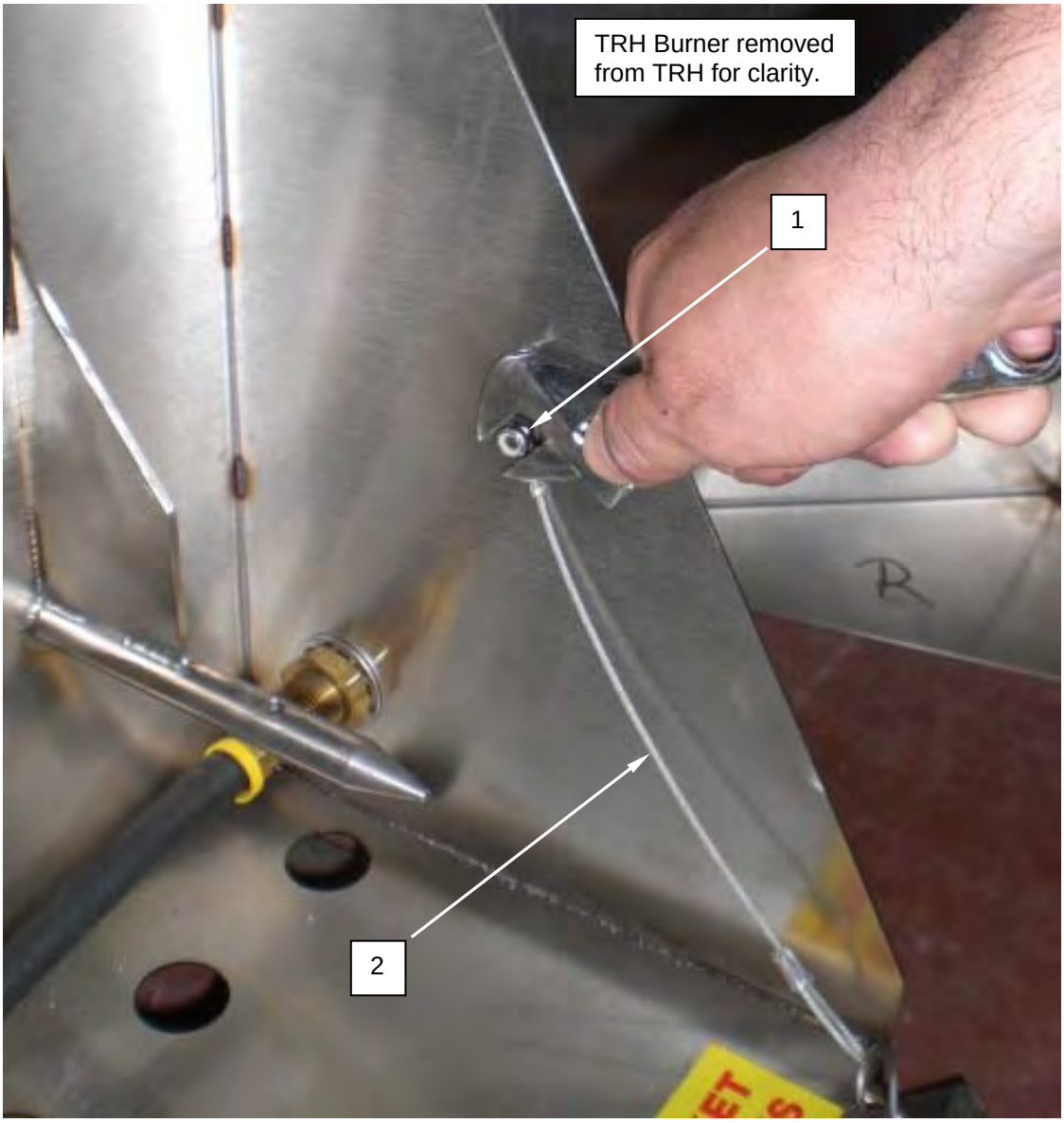


Figure 2. Replacing Wire Rope Assembly.

7. Place pin lock on wire rope assembly back in saddle pin by sliding pin lock through wire rope assembly eyelet.

END OF TASK

REPAIR - CONTINUED

Replacing the Pin Lock

1. Remove pin lock (Figure 3, Item 1) from saddle pin in TRH Burner housing.
2. Remove pin lock (Figure 3, Item 1) from wire rope assembly (Figure 3, Item 2) by sliding pin lock through wire rope assembly eyelet (Figure 3, Item 3).
3. Place replacement pin lock (Figure 3, Item 1) on wire rope assembly (Figure 3, Item 2) by sliding pin lock through wire rope assembly eyelet (Figure 3, Item 3).
4. Place pin lock back in saddle pin.

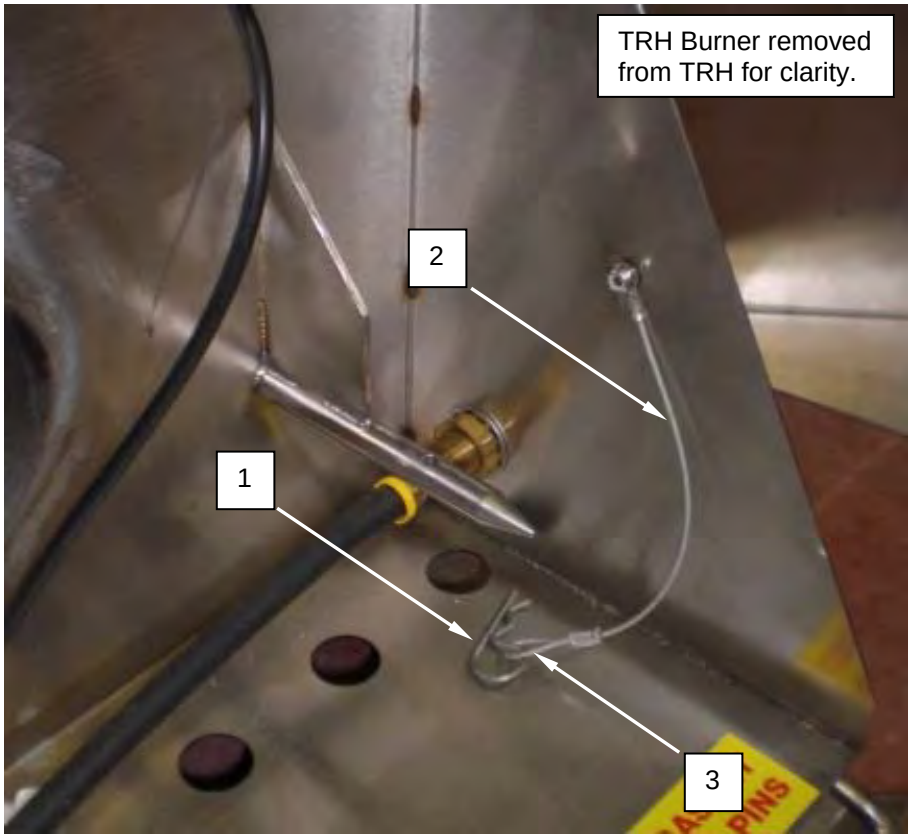


Figure 3. Pin Lock Replacement.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE

ADAPTER KIT, GRAVITY FEED REPLACE

INITIAL SETUP:

Personnel Required

Food Service Specialist 92G
Food Service Technician 3381

REPLACE

WARNING

Do not attempt to connect a fuel line to the TRH in the vicinity of any open flame. Ensure that the fuel hose connections are made properly to avoid fuel spillage. Prevent a possible fire hazard by having absorbent materials or fuel mats on hand to absorb any spillage. Failure to observe safety precautions may result in injury or death to personnel.

1. Disconnect QD fitting (Figure 1, Item 1) connecting fuel hose (Figure 1, Item 2) to fuel can adapter (Figure 1, Item 3).

2. Remove fuel can adapter (Figure 1, Item 3) from fuel can, ensuring dip tube is connected to fuel can adapter (Figure 1, Item 3).

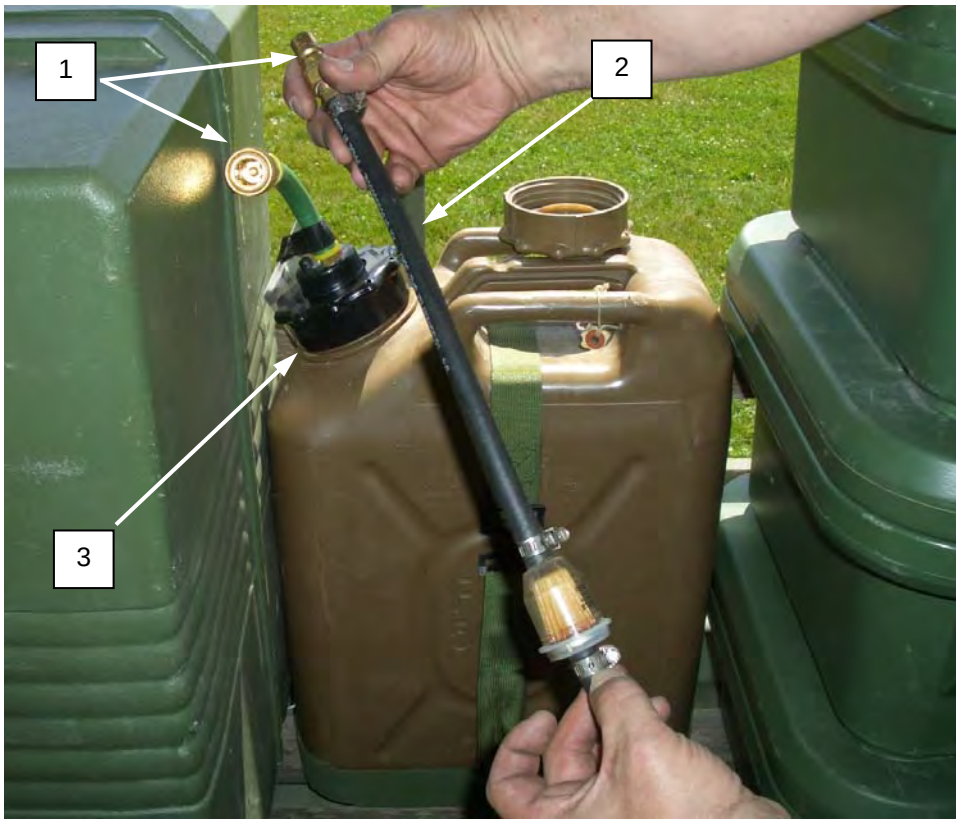


Figure 1. Disconnecting Fuel Hose.

REPLACE - CONTINUED

3. Ensure a dip tube is placed on replacement fuel can adapter by pressing dip tube (Figure 2, Item 1) into adapter tube fitting until it seats. Install fuel can adapter (Figure 2, Item 2) on fuel can by screwing adapter onto fuel can.

NOTE

Older fuel cans have a vent cock to allow for easy fuel flow during operation. If the fuel can being used is fitted with a vent cock, refer to step 4. If using a newer, self-venting fuel can adapter, skip to step 5.

4. For older fuel cans, vent fuel can by loosening vent cock on top of can adapter. Loosen vent cock by turning counter-clockwise to fully open position (Figure 2, Item 3).

Figure 2. Fuel Can Adapter and Vent Cap.

REPLACE – CONTINUED

5. Connect fuel line (Figure 3, Item 1) to fuel can and TRH using two QD fittings (Figure 3, Item 2). Fuel filter (Figure 3, Item 3) should be closer to the fuel can than to the TRH.

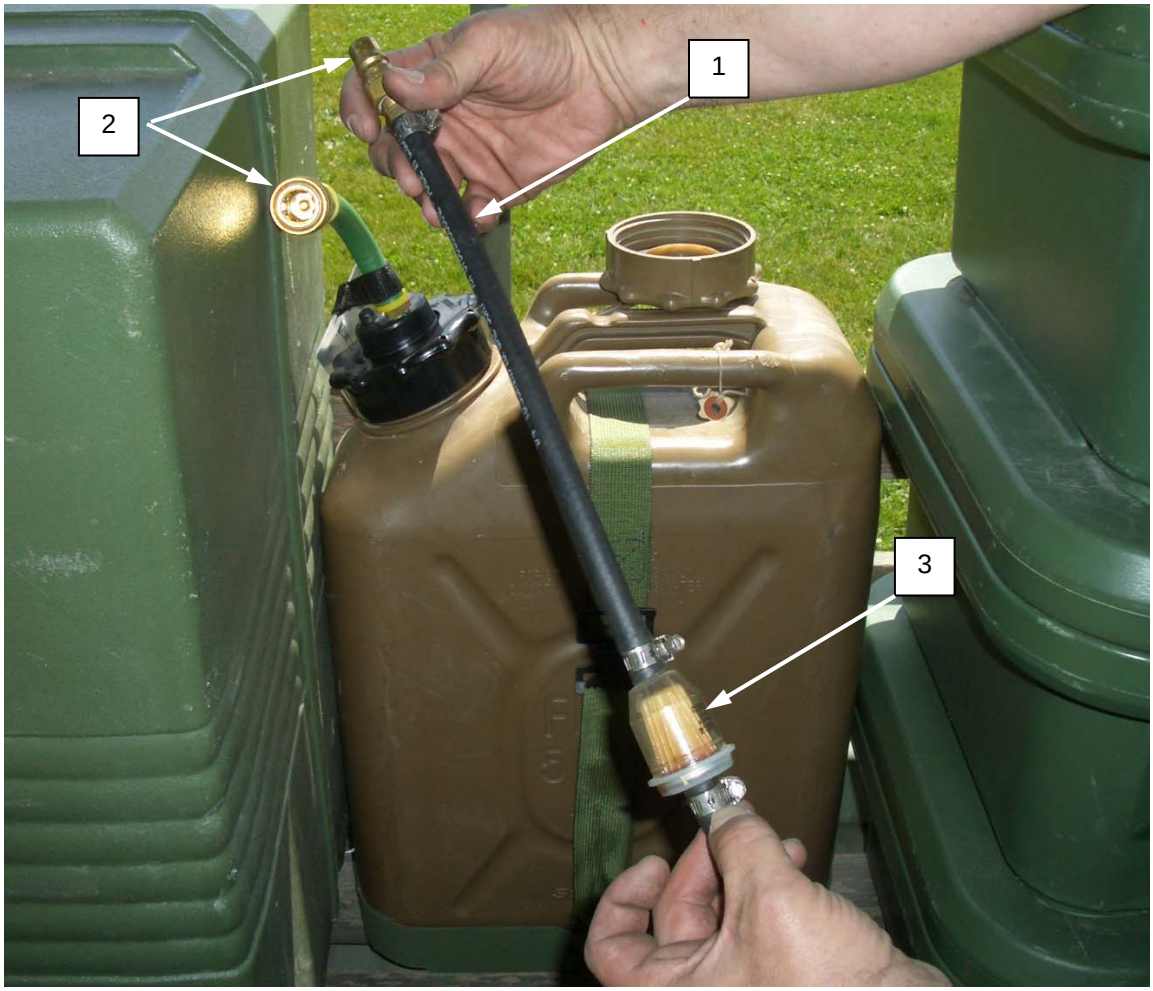


Figure 3. Fuel Line Connection.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE

FILTER ELEMENT, FLUID
REPLACE

INITIAL SETUP:

Tools and Special Tools

Maintenance Kit (WP 0066, Item 1)
Tool Kit (WP 0066, Item 3)

Materials/Parts

Oil and Water Absorbent Material (WP 0065, Item 1)
Drip Pan (or other suitable container)
Chemical and Oil Protective Gloves (WP 0065, Item 9)
Wiping Rag (WP 0065, Item 13)

Personnel Required

Food Service Specialist 92G (2)
Food Service Technician 3381 (2)

Equipment Condition

Fuel and Power disconnected

References

WP 0026

REPLACE

The fuel filters for the AK exist in two locations: one on the TRH fuel line (Figure 1, Item 1) and one in the burner compartment of the TRH (Figure 1, Item 2). They are identical and the replacement procedures are the same for each filter. If necessary, remove burner IAW WP 0026 to access the filter in the burner compartment (Figure 1, Item 2).

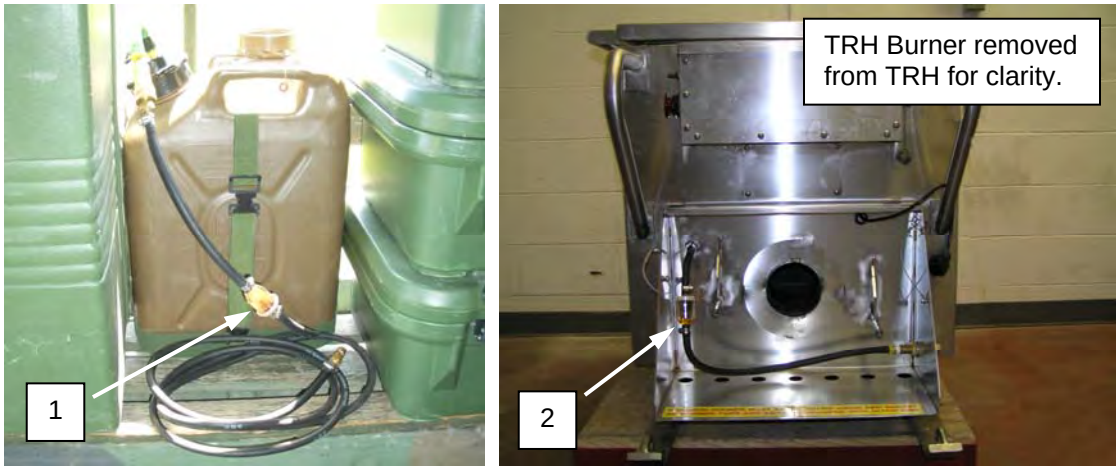


Figure 1. Fuel Filter Locations.

REPLACE - CONTINUED

WARNING

Do not attempt to service on a fuel line in the vicinity of any open flame. Ensure that the fuel hose connections are made properly to avoid fuel spillage. Prevent a possible fire hazard by having absorbent materials or fuel mats on hand to absorb any spillage. Failure to observe safety precautions may result in injury or death to personnel.

NOTE

Use gravity to drain fuel from fuel lines.

1. Loosen hose clamps on both sides of a filter (Figure 2, Item 1 and Item 2) with a flat-tip screwdriver. Pull fuel lines off of the filter.

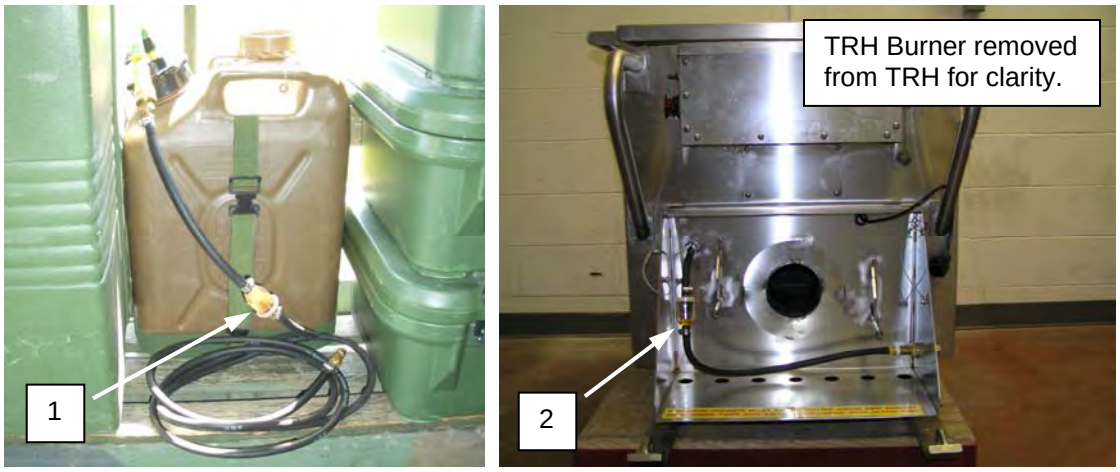


Figure 2. Replace Fuel Filters.

2. Make sure that hose clamps stay on the hose so that clamps easily slide into place once you connect the hoses to the filter.

3. Plug fuel lines into ends of new filter, ensuring that arrow on fuel filter points in direction of fuel flow.

4. Tighten hose clamps on both sides of the fuel filter with a flat-tip screwdriver.

5. Dispose of dirty filter IAW unit SOP.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE

RACK, TRAY RATION
REPLACE

INITIAL SETUP:

Personnel Required

Food Service Specialist 92G
Food Service Technician 3381

Equipment Condition

TRH turned OFF and cooled

REPLACE

WARNING

DO NOT remove the tray pack rack immediately after TRH use. The tray pack rack may be hot. Allow the tray pack rack to cool before attempting to remove or wear protective gloves when handling tray pack rack.

1. Open the TRH tank lid (Figure 1, Item 1) and remove tray pack rack (Figure 1, Item 1).

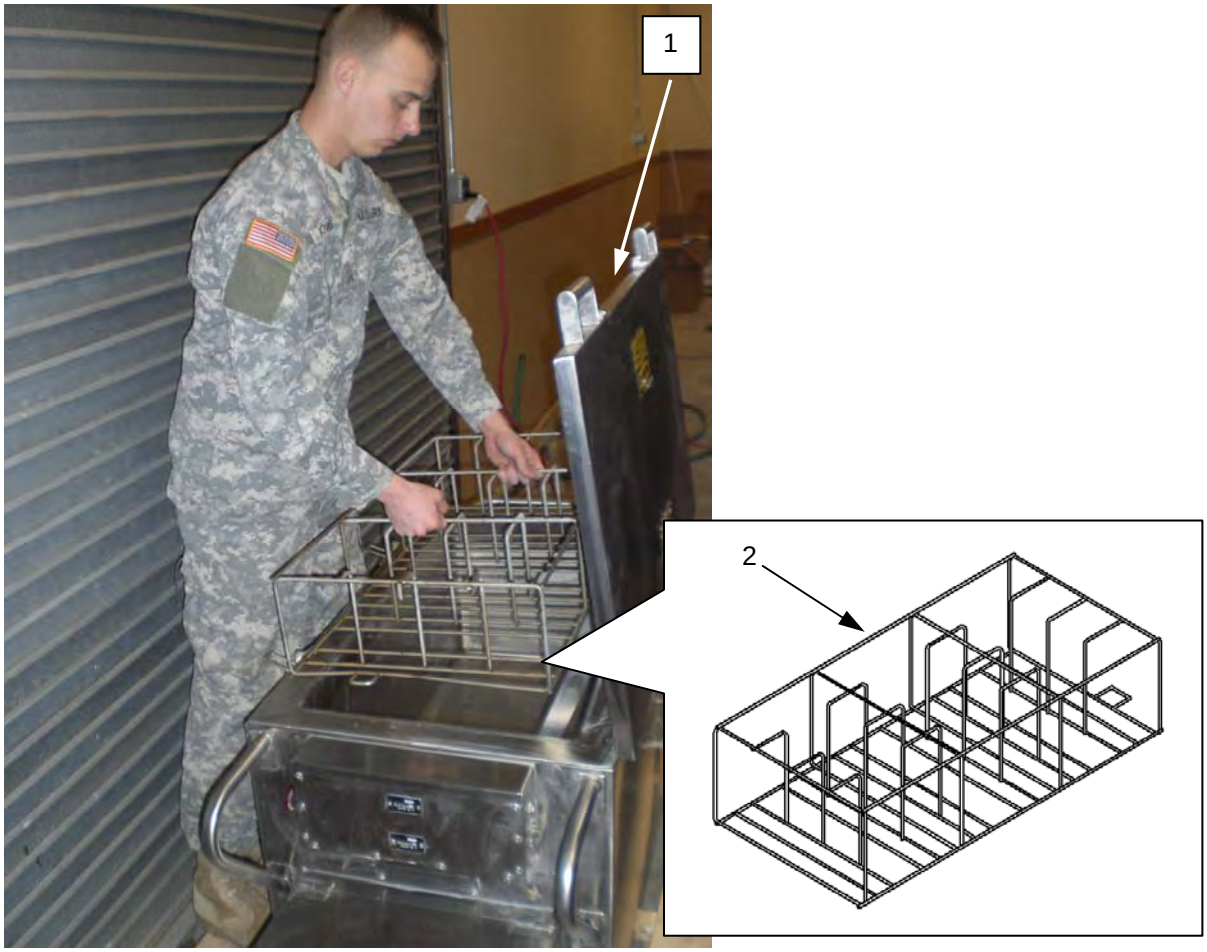


Figure 1. TRH Tray Rack Removal.

REPLACE - CONTINUED

2. Replace tray pack rack (Figure 2, Item 1) with standoff tab (Figure 2, Item 2) facing towards the TRH burner compartment.

Figure 2. TRH Tray Rack Removal.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE

POWER CORD
REPLACE

INITIAL SETUP:

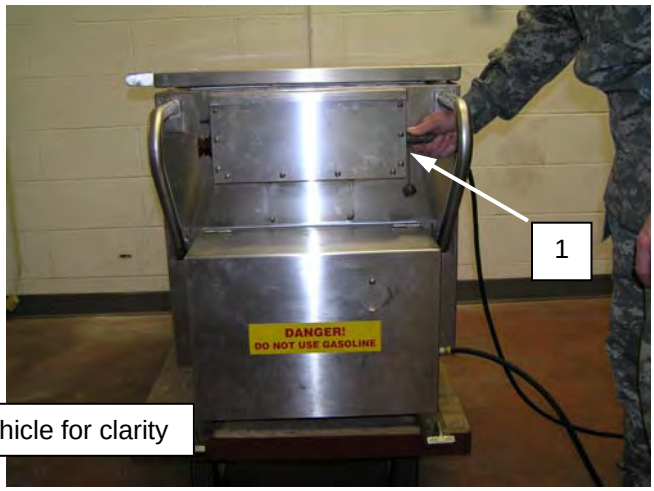
Personnel Required

Food Service Specialist 92G
Food Service Technician 3381

REPLACE

1. Disconnect TRH power cord from electrical connector receptacle on TRH electrical control box (Figure 1, Item 1) by twisting and pulling connector away from receptacle.

2. Disconnect TRH power cord 3 prong connector from the GFCI outlet on the power inverter (Figure 1, Item 2).



TRH Removed from vehicle for clarity

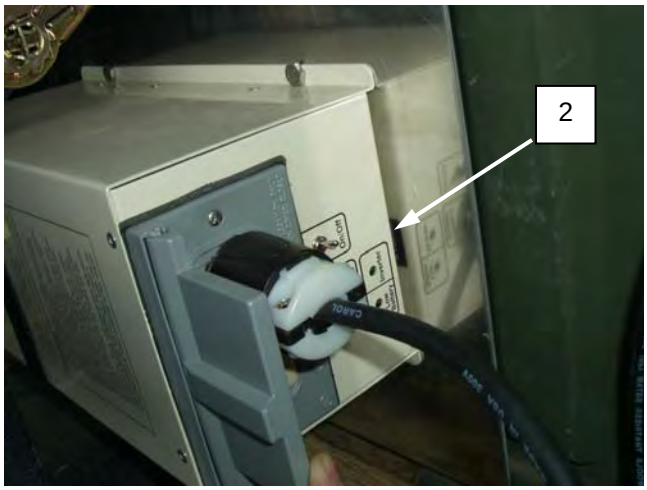
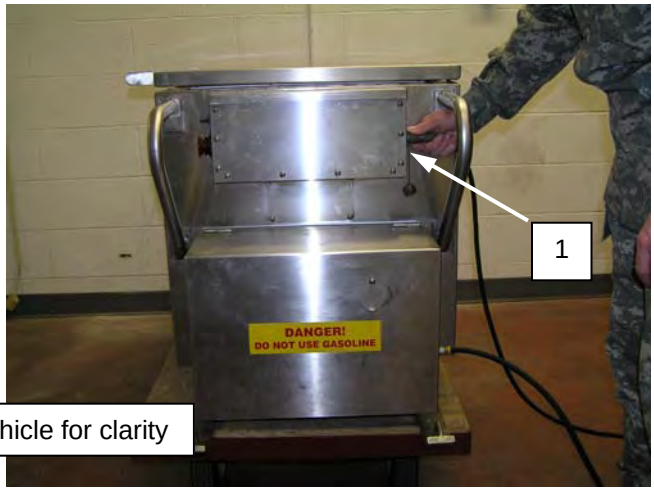


Figure 1. TRH Power Connections.

REPLACE – CONTINUED

3. Connect replacement TRH power cord electrical connector to electrical connector receptacle on TRH electrical control box (Figure 2, Item 1).

4. Connect TRH power cord 3-prong connector to the GFCI outlet on the power inverter (Figure 2, Item 2).



TRH Removed from vehicle for clarity

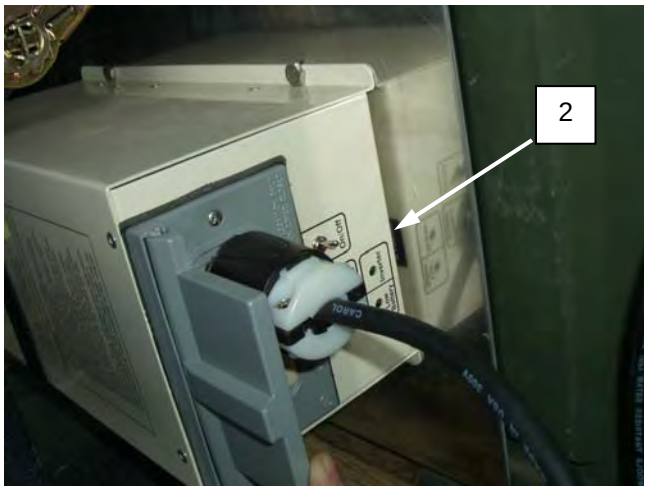


Figure 2. TRH Power Connections.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE

ASSEMBLY, LID
ADJUST, REPLACE

INITIAL SETUP:

Tools and Special Tools

Maintenance Kit (WP 0066, Item 1)
Tool Kit (WP 0066, Item 3)

Personnel Required

Food Service Specialist 92G
Food Service Technician 3381
Non-specified MOS

Materials/Parts

Vegetable Oil (WP 0065, Item 20)

Equipment Condition

TRH turned OFF and allowed to cool

ADJUST

Adjusting the Lid Latches

1. Release lid latches by pulling handles up.

2. Adjust lid latch (Figure 1, Item 1) by adjusting position of upper (Figure 1, Item 2) and lower (Figure 1, Item 3) retaining nuts on both sides of lid latch.

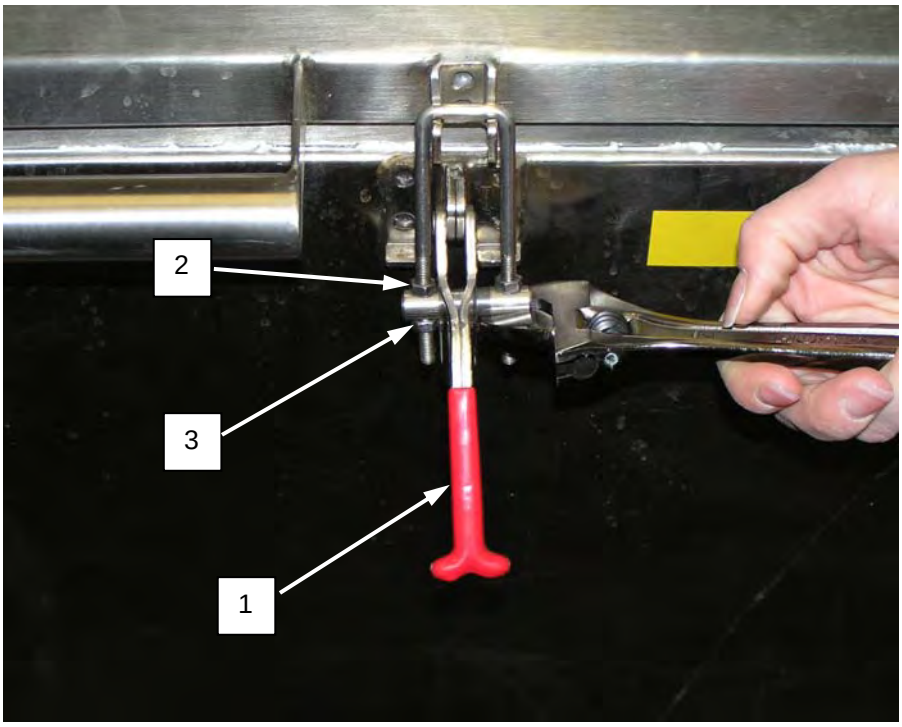


Figure 1. Adjusting the Lid Latch.

3. Ensure the lid is tight enough to compress the lid latch and prevent water leakage. Do not tighten to the point where excessive force is required to close and secure lid latches.

END OF TASK

ADJUST – CONTINUED

Adjusting the Lid Alignment

1. Raise lid and latch.
2. Remove lid stop bolt (Figure 2, Item 1).
3. Hold lid upright and pull lid stop bolt out of the lid stop.

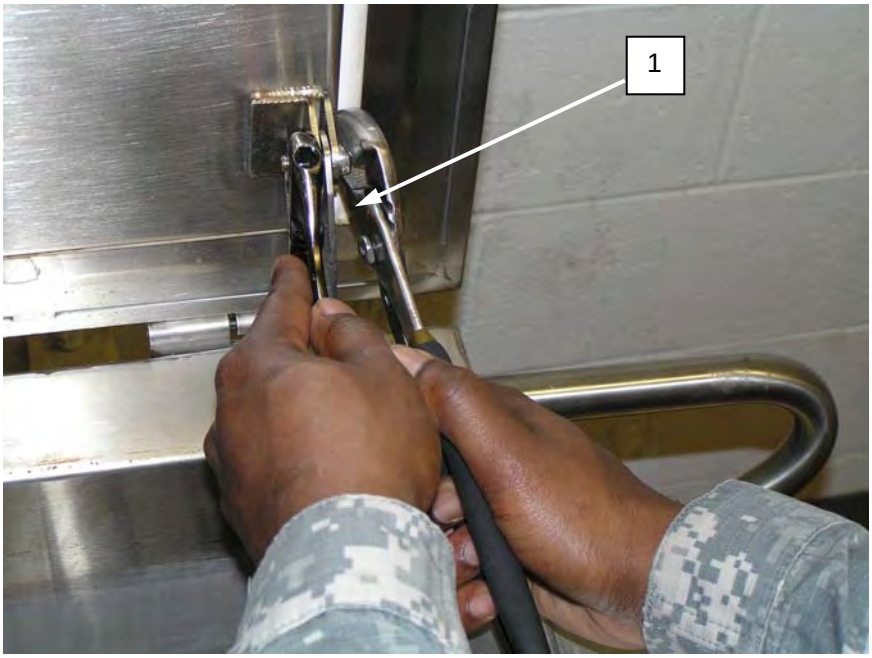


Figure 2. Removing Lid Stop Bolt.

4. Remove lid stop and hardware from lid bracket (Figure 3, Item 1) and retain with TRH Tank.

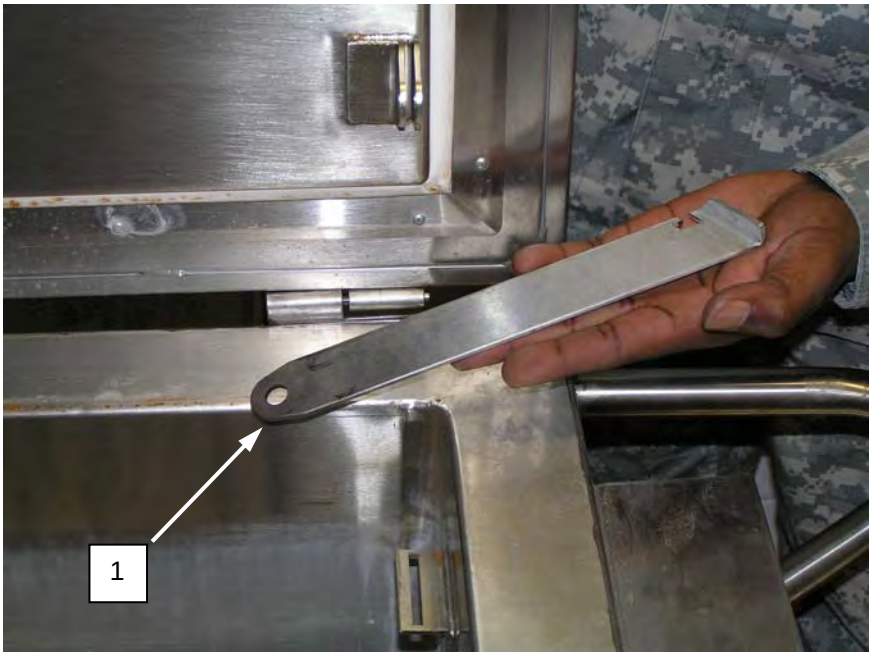


Figure 3. Removing Lid Stop.

ADJUST – CONTINUED

5. Adjust the alignment of the TRH Lid by tapping the lid (Figure 4, Item 1) towards the desired direction with a hammer (Figure 4, Item 2) and a block of wood (Figure 4, Item 3).

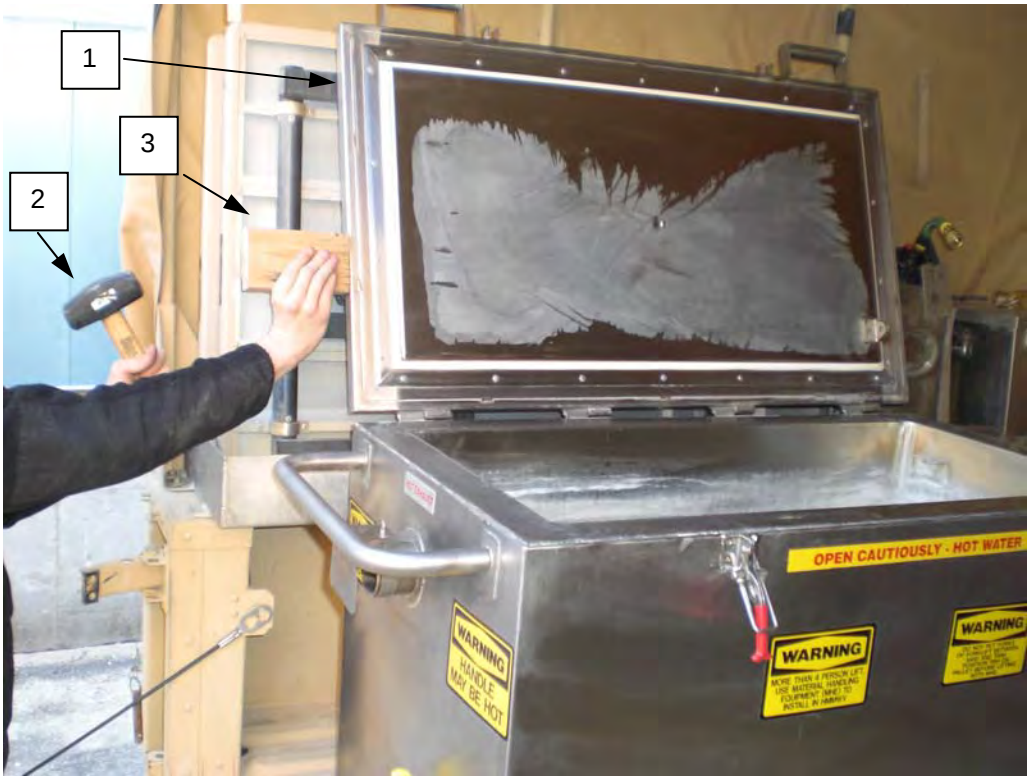


Figure 4. Adjusting the TRH Tank Lid.

6. Close and test fit lid. Repeat steps as necessary until proper adjustment is achieved.

7. Re-install lid stop.

END OF TASK

REPLACE

1. Raise lid and latch.
2. Remove lid stop bolt (Figure 5, Item 1).
3. Hold lid upright and pull lid stop bolt out of the lid stop.

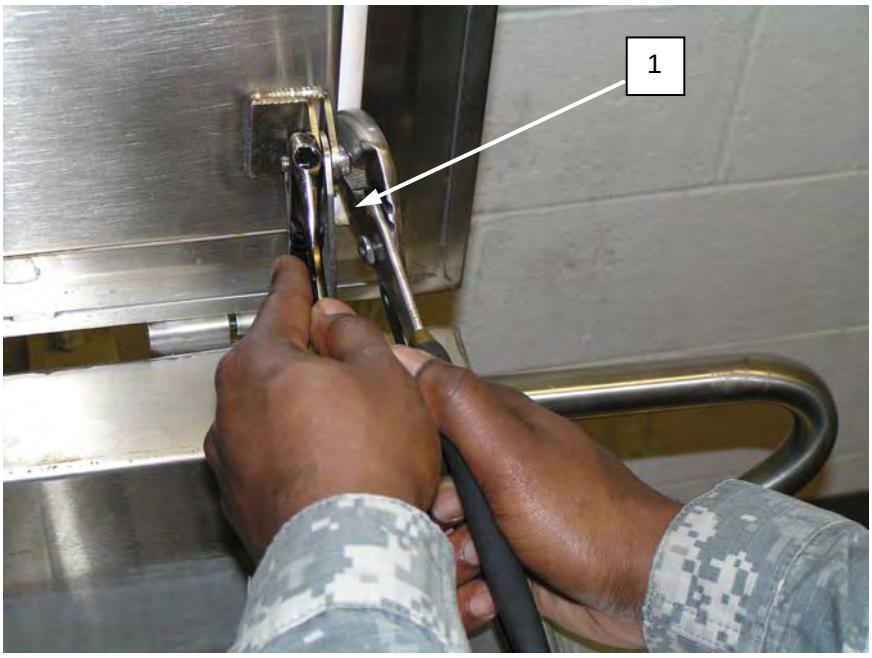


Figure 5. Removing Lid Stop Bolt.

4. Remove lid stop from lid assembly bracket (Figure 6, Item 1).

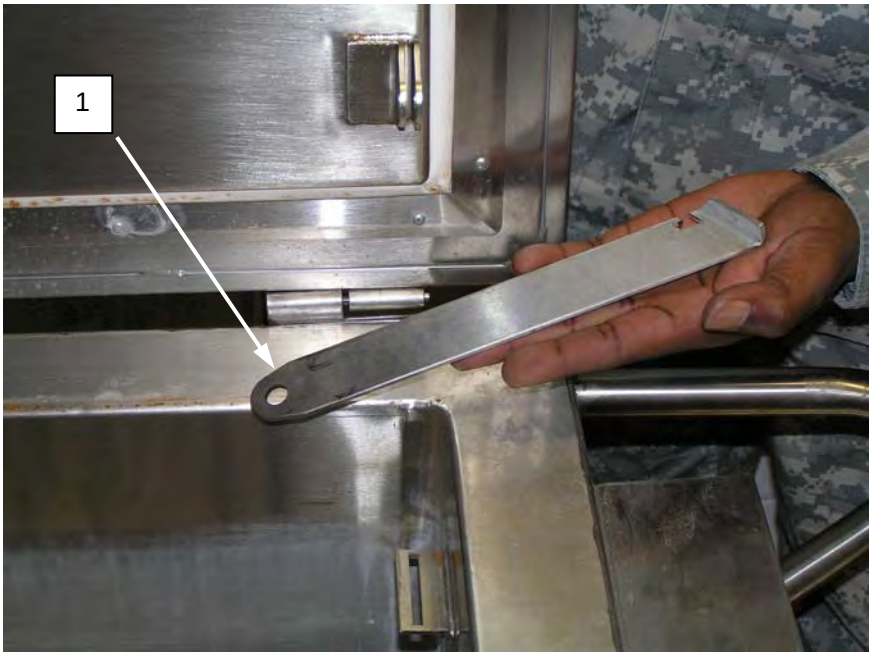


Figure 6. Removing Lid Stop.

REPLACE – CONTINUED

5. Using a hammer and a block of wood, tap lid toward burner assembly until it separates from the TRH (Figure 7, Item 1).

Figure 7. Unseating Lid With Hammer.

REPLACE – CONTINUED

WARNING

The TRH lid ways approximately 42 lbs. Use two people, lifting with legs, not back, to remove and install the TRH lid. Failure to observe this warning may result in injury to personnel

NOTE

Installation of a new lid assembly may require light lubrication. Apply a light coating of food safe vegetable oil to the replacement lid hinges, if necessary.

6. Install new lid (Figure 8, Item 1) by aligning the hinges with the lid hinge pins (Figure 8, Item 2) and tapping the lid with a hammer and a block of wood toward the exhaust end of the TRH.

Figure 8. Aligning the TRH Tank Lid.

7. Close and test fit lid. Adjust lid alignment as necessary until proper alignment is achieved.

8. Reinstall lid stop.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE

STRAIGHT PIPE TO HOSE ADAPTER REPLACE

INITIAL SETUP:

Tools and Special Tools	Personnel Required
Maintenance Kit (WP 0066, Item 1) Tool Kit (WP 0066, Item 3)	Food Service Specialist 92G Food Service Technician 3381
Materials/Parts	**Equipment Condition**
Teflon Tape (WP 0065, Item 19)	TRH Tank Empty

REPLACE

1. Using slip-joint pliers and an adjustable wrench, remove pipe to hose adapter (Figure 1, Item 1) from ball valve (Figure 1, Item 2) by placing pliers across the “flats” of the pipe to hose adapter and drain valve.

2. Hold ball valve steady and rotate the pipe to hose adapter counter clockwise.

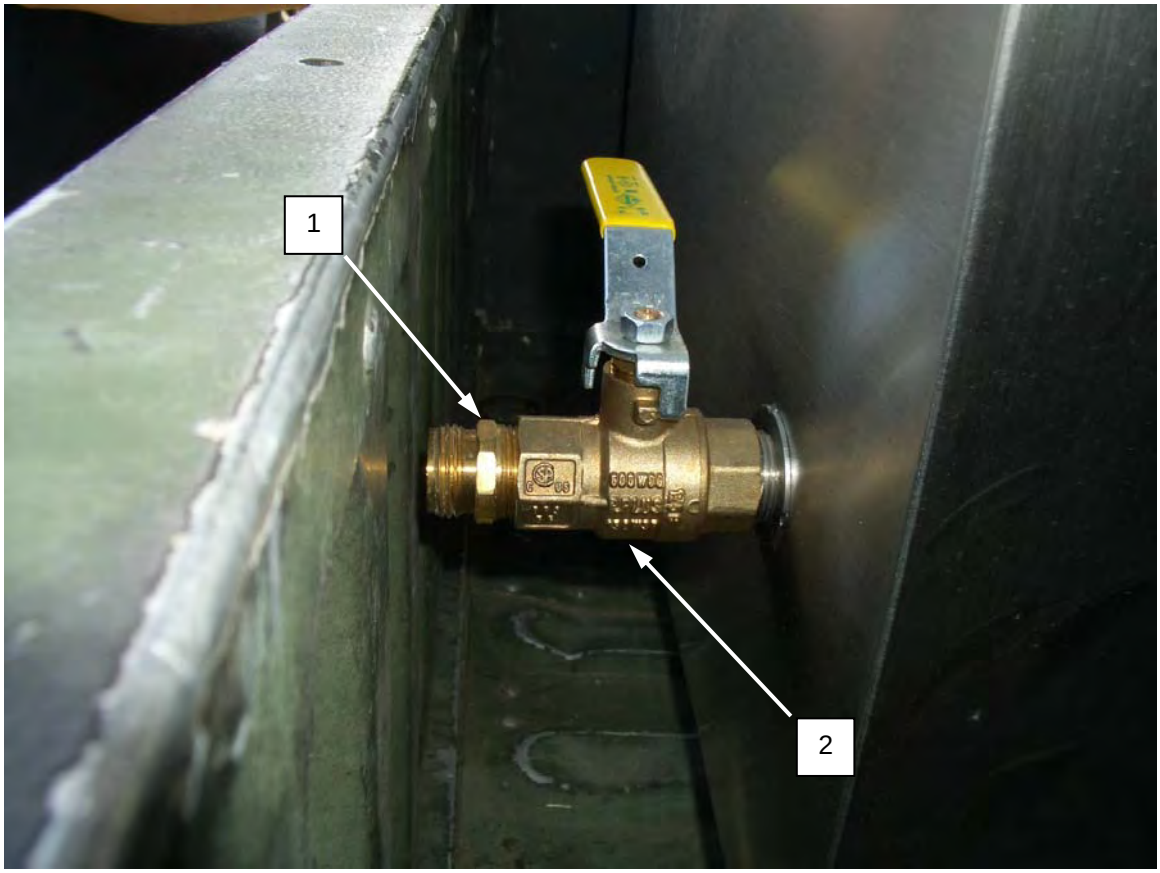


Figure 1. Removing the Pipe To Hose Adapter.

REPLACE – CONTINUED

3. Remove and replace pipe to hose adapter (Figure 2, Item 1) with serviceable item.

4. Using a minimum of two wraps, apply Teflon tape to threads on end of ball valve by wrapping clockwise.

5. Hand thread the new pipe to hose adapter (Figure 1, Item 1) onto end of ball valve.

6. Using slip-joint pliers and an adjustable wrench, tighten the pipe to hose adapter (Figure 1, Item 1) onto ball valve until secure, do not over tighten.

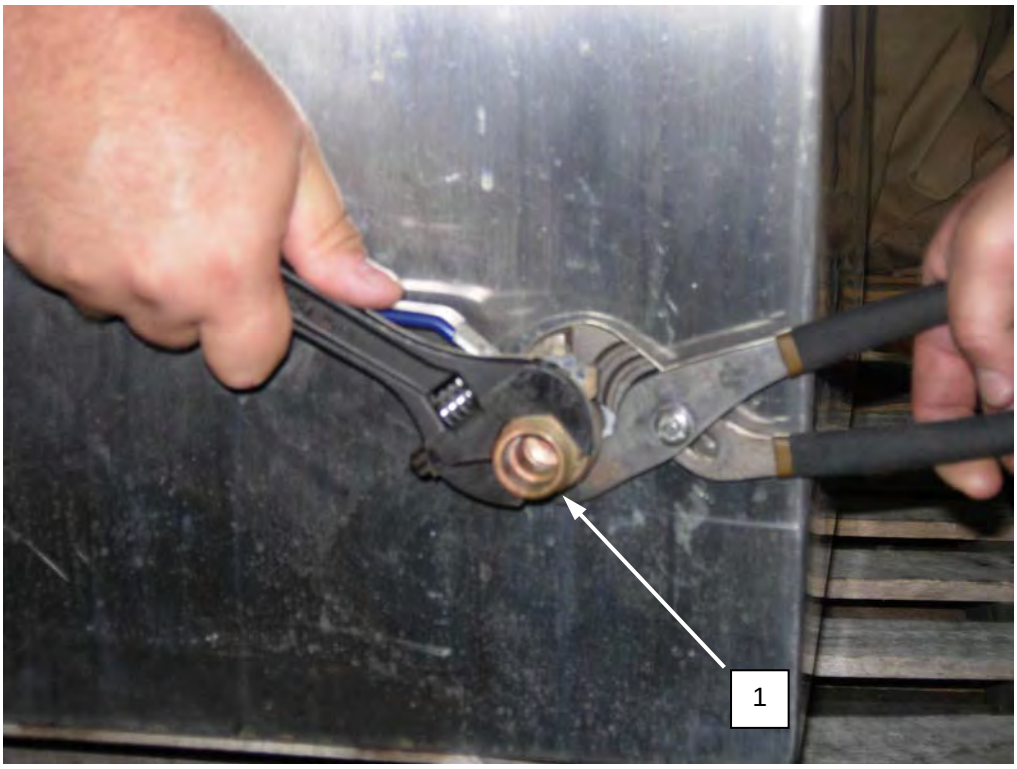


Figure 2. Installing the Pipe To Hose Adapter.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE

BALL VALVE
REPLACE

INITIAL SETUP:

Tools and Special Tools

Maintenance Kit (WP 0066, Item 1)
Tool Kit (WP 0066, Item 3)

Personnel Required

Food Service Specialist 92G
Food Service Technician 3381

Materials/Parts

Teflon Tape (WP 0065, Item 19)

Equipment Condition

TRH Tank Empty

REPLACE

1. Using slip-joint pliers and an adjustable wrench, remove the pipe to hose adapter (Figure 1, Item 1) from ball valve (Figure 1, Item 2) by placing pliers across the “flats” of the pipe to hose adapter and drain valve.

2. Hold ball valve steady with one pair of slip-joint pliers and rotate the pipe to hose adapter counter clockwise with the adjustable wrench.

3. Remove pipe to hose adapter and retain for use with replacement ball valve.

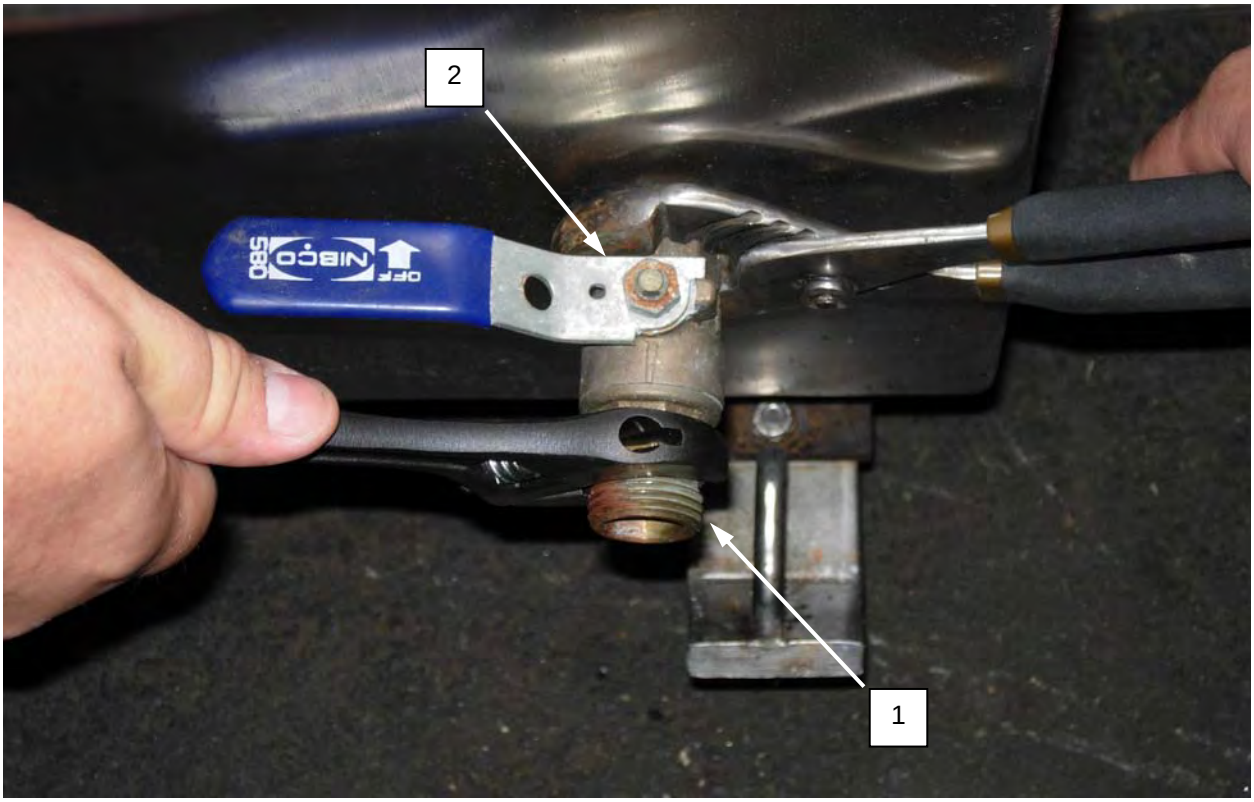


Figure 1. Removing the Pipe To Hose Adapter.

REPLACE – CONTINUED

4. Using slip-joint pliers, remove ball valve (Figure 2, Item 1) by placing pliers across the “flats” of the ball valve closest to the tank and rotating the ball valve counter clockwise.

5. Using a minimum of two wraps, apply Teflon tape to threaded drain pipe on TRH Tank by wrapping clockwise.

6. Hand thread the replacement ball valve (Figure 2, Item 1) onto the TRH Tank.

7. Tighten the replacement ball valve (Figure 2, Item 1) with the wrench until the handle is on top, do not over tighten.

8. Using a minimum of two wraps, apply Teflon tape to threads on end of ball valve by wrapping clockwise.

9. Hand thread the pipe to hose adapter onto end of the replacement ball valve (Figure 2, Item 1).

10. Using slip-joint pliers and an adjustable wrench, tighten the pipe to hose adapter onto the replacement ball valve (Figure 2, Item 1) until secure. Do not over tighten.

Figure 2. Replacing the Drain Valve.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE

EXHAUST PIPE
REPLACE

INITIAL SETUP:

Equipment Condition	Personnel Required
TRH turned OFF and cooled	Food Service Specialist 92G Food Service Technician 3381

REPLACE

WARNING

DO NOT touch hot metal surfaces with bare hands. Allow surfaces to cool or wear protective gloves when performing maintenance on a hot metal surface. Failure to observe warnings may result in injury or death to personnel.

NOTE

Exhaust elbow should remain on TRH at all times.

1. Loosen the exhaust elbow retaining screw (Figure 1, Item 1).
2. Slide the exhaust elbow (Figure 1, Item 2) away from TRH tank until elbow is free from exhaust pipe (Figure 1, Item 3).

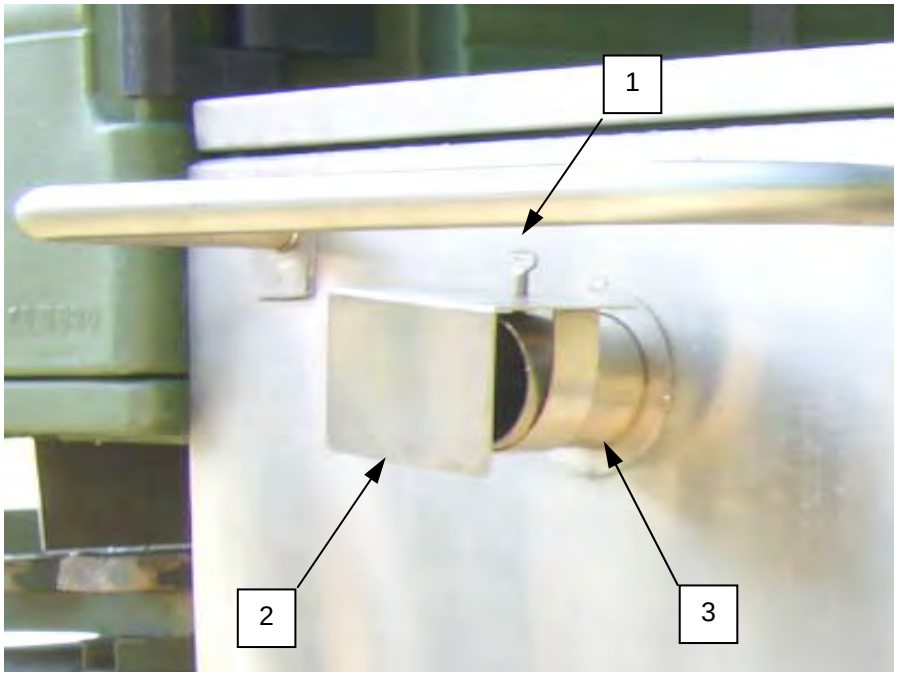


Figure 1. TRH Exhaust Elbow.

REPLACE - CONTINUED

3. Slide replacement exhaust elbow (Figure 2, Item 1) over TRH exhaust pipe (Figure 2, Item 2) until exhaust elbow is secure to pipe but not blocking pipe opening (Figure 2, Item 3). Orient Exhaust pipe downward.

4. Hand tighten exhaust elbow retaining screw (Figure 2, Item 4).

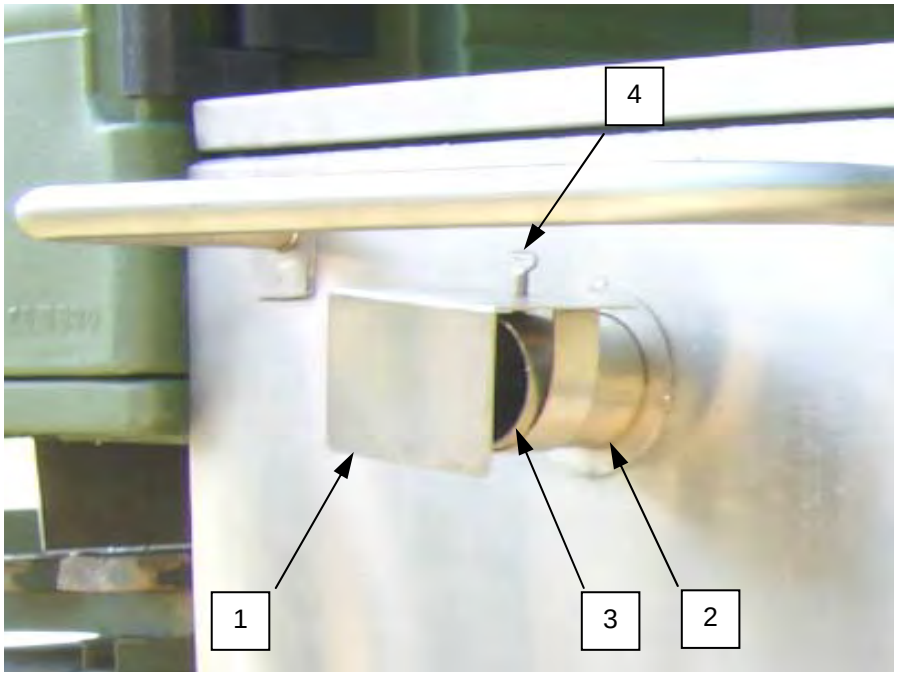


Figure 2. TRH Exhaust Elbow.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE

BURNER, MULTI-FUEL
REPLACE

INITIAL SETUP:

Tools and Special Tools

Maintenance Kit (WP 0066, Item 1)
Tool Kit (WP 0066, Item 3)

Personnel Required

Food Service Specialist 92G
Food Service Technician 3381

Materials/Parts

Oil and Water Absorbent Material
(WP 0065, Item 1)
Chemical and Oil Protective Gloves
(WP 0065, Item 9)
Industrial Goggles (WP 0065, Item 10)
Wiping Rag (WP 0065, Item 13)

REPLACE

Burner Removal

1. Push the Tray Ration Heater red, Pull-ON/Push-OFF switch (Figure 1, Item 1) to the OFF position.
2. Ensure Tray Ration Heater is not connected to any power source to prevent electrical shock and inadvertent burner ignition.

WARNING

Before removing the TRH Burner from the TRH, ensure the TRH Red, Pull-ON/Push-OFF switch is in the OFF position and the TRH electrical control box is unplugged from power source to prevent electrical shock and inadvertent burner ignition.

3. Disconnect fuel line from TRH Tank at QD fitting (Figure 1, Item 2).
4. Lift burner cover (Figure 1, Item 3) and gently tap cover to the right to remove from hinges.

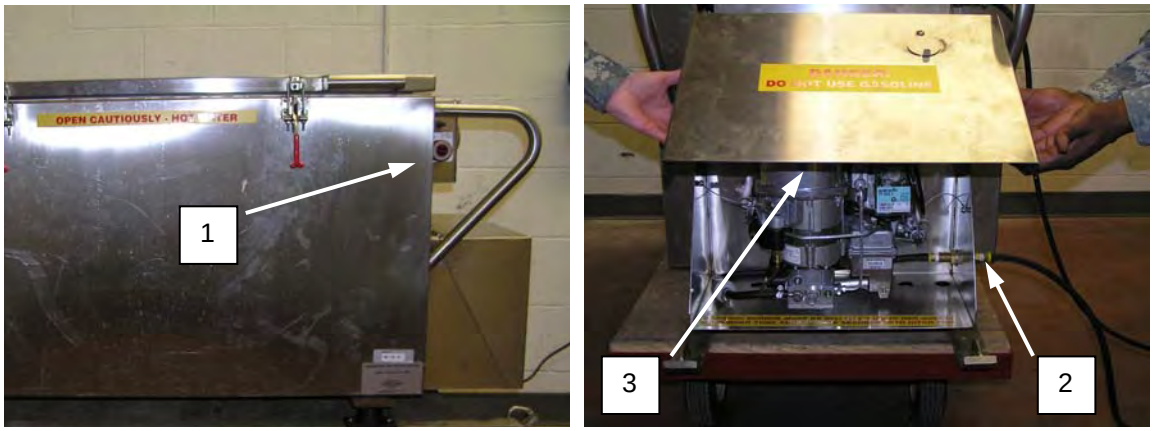


Figure 1. Burner On/Off Switch and Cover Removal.

REPLACE – CONTINUED

WARNING

Do not attempt to disconnect a fuel line on the TRH in the vicinity of any open flame. Ensure that the fuel hose connections are made properly to avoid fuel spillage. Prevent a possible fire hazard by having absorbent materials or fuel mats on hand to absorb any spillage. Failure to observe safety precautions may result in injury or death to personnel.

5. Remove fuel line connection by loosening the attached hose clamp (Figure 2, Item 1) and place fuel line on stud (Figure 2, Item 2) in TRH Burner compartment.

6. Loosen integral screw enough to remove female power cord plug (Figure 2, Item 3).

Figure 2. Hose Clamp and Power Cord Removal.

7. Remove the hitch-pins (Figure 3, Item 1) and clip them to the side of burner cover.

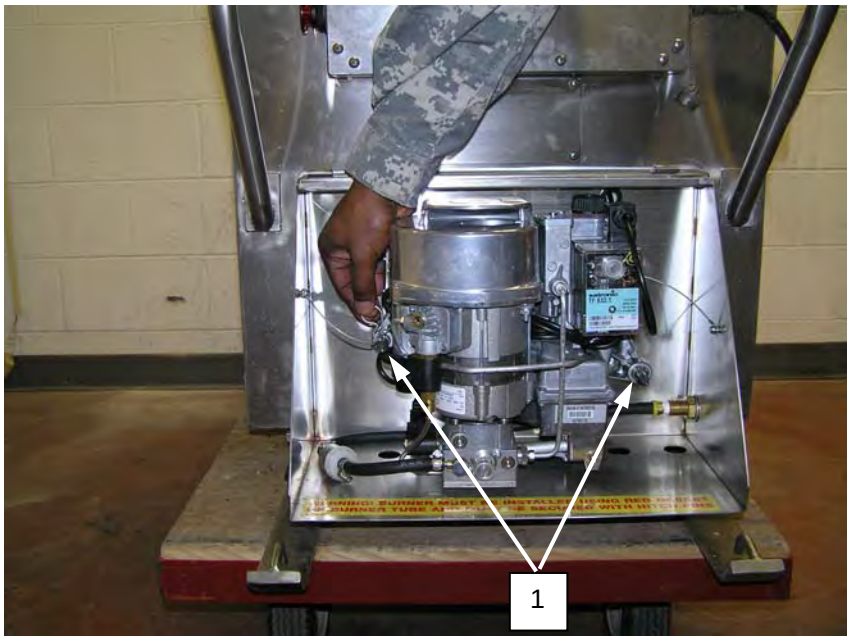


Figure 3. Remove Hitch Pins.

REPLACE – CONTINUED

WARNING

Use caution when removing the burner from the TRH. Prevent a possible fire hazard by having absorbent materials or fuel mats on hand to absorb any spillage. Failure to observe safety precautions may result in injury or death to personnel.

8. Without letting the TRH Burner tip forward, slide the burner straight out from the TRH using two hands.

9. Place TRH Burner on a suitable work surface.

WARNING

Use caution when draining fuel from the TRH Burner. Prevent a possible fire hazard by having absorbent materials or fuel mats on hand to absorb any spillage. Failure to observe safety precautions may result in injury or death to personnel.

WARNING

Use caution when draining fuel from the TRH Burner. Fuel draining from the TRH Burner fuel sump may flow rapidly. This could cause fuel spatter or spills on skin or clothing. Keep eyes protected and wash any clothing, equipment, or skin that is contaminated by fuel.

NOTE

Be sure to retrieve and replace sump plug after draining fuel from TRH Burner fuel sump. During removal, fuel sump plug may fall into drainage container. If this occurs do not forget to retrieve and replace sump plug.

10. Drain fuel from TRH burner by removing fuel sump drainage plug (Figure 4, Item 1) and draining fuel into an acceptable container (Figure 4, Item 2).

11. Install drain plug.

Figure 4. Draining Fuel Sump.

END OF TASK

REPLACE - CONTINUED

Burner Installation

CAUTION

DO NOT install a TRH Burner in the TRH without a red flange gasket. The gasket is used to protect the body of the TRH and the TRH Burner components. Failure to install a flange gasket on a TRH Burner before installation may result in damage to equipment.

1. Ensure the burner to be installed has a red flange gasket (Figure 5, Item 1) on the flame tube before placing in the TRH.

Figure 5. Burner with Red Flange Gasket.

REPLACE – CONTINUED

2. Using two hands, slide burner onto the saddle pins (Figure 6, Item 1) and install the retaining hitch-pins from saddle pins on both sides of the burner.

3. Install fuel line on suction inlet port (Figure 6, Item 2) and tighten fuel clamp.

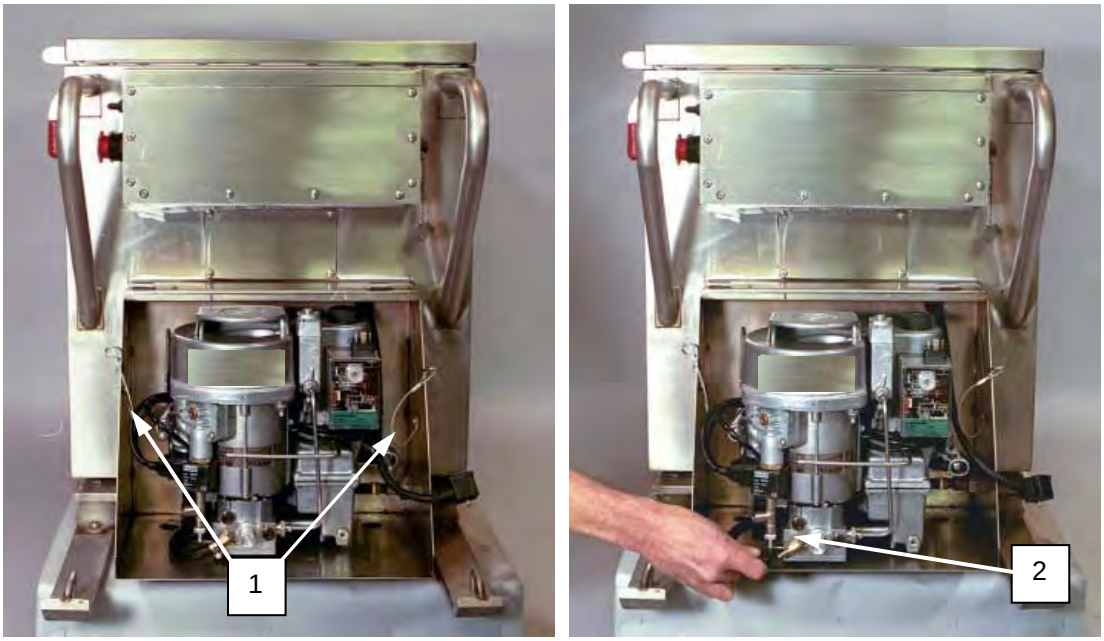


Figure 6. Burner Saddle Pins and Fuel Line Installation.

4. Insert female power cord plug into top of burner control box base and secure it by tightening the screw that is integral to the power plug (Figure 7, Item 1).

5. Align burner cover with hinges (Figure 7, Item 2) and tap to left to install and swing down to cover burner.

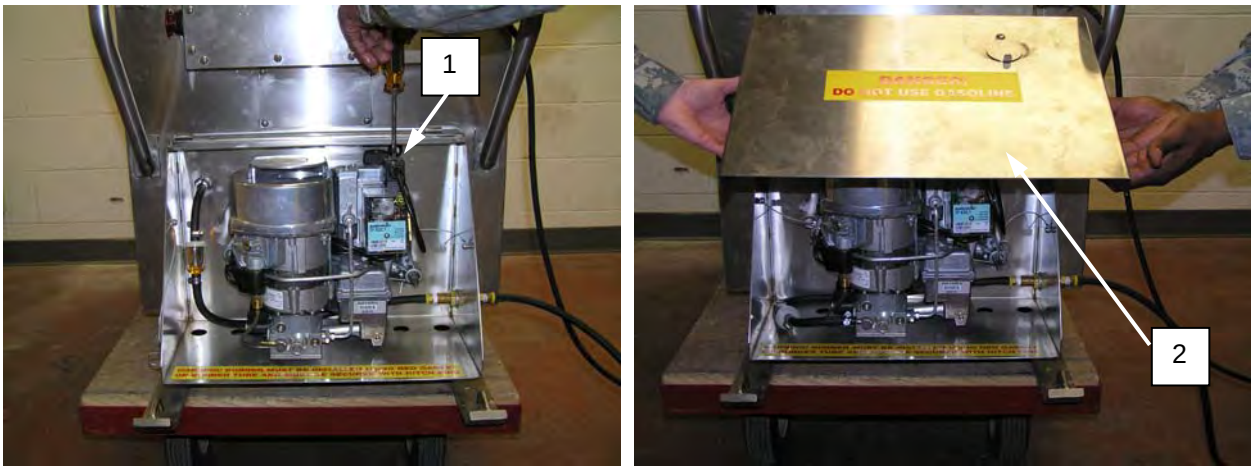


Figure 7. Power Plug Installation.

REPLACE – CONTINUED

WARNING

Do not attempt to connect a fuel line to the TRH in the vicinity of any open flame. Ensure that the fuel hose connections are made properly to avoid fuel spillage. Prevent a possible fire hazard by having absorbent materials or fuel mats on hand to absorb any spillage. Failure to observe safety precautions may result in injury or death to personnel.

6. Connect fuel line (Figure 8, Item 1) to fuel can and TRH using two quick disconnect fittings (Figure 8, Item 2). Fuel filter (Figure 8, Item 3) shall be closer to the fuel can than to the TRH.

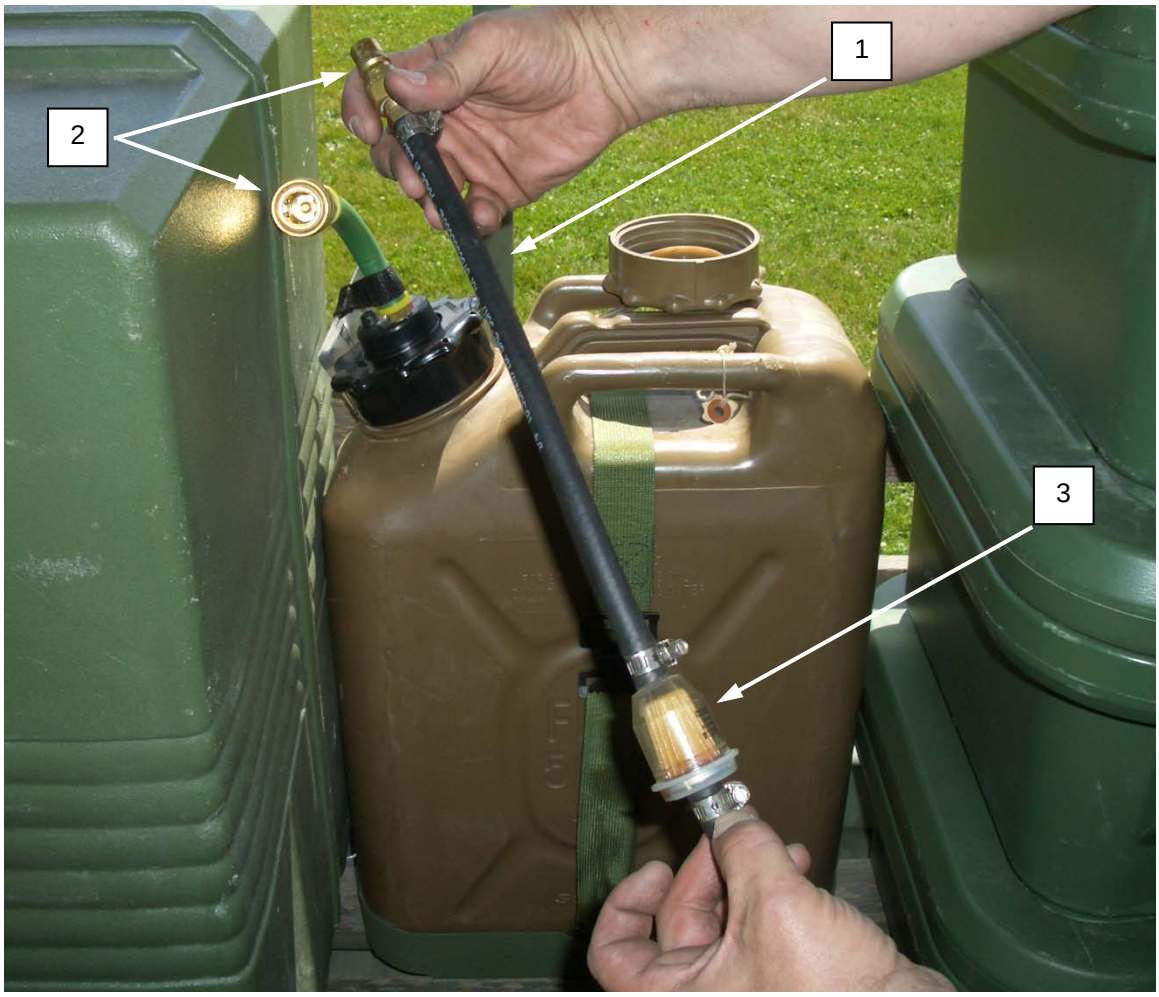


Figure 8. Fuel Line Connection.

REPLACE – CONTINUED

WARNING

HIGH VOLTAGE is used in the operation of this equipment. **DEATH ON CONTACT** may result if personnel fail to observe safety precautions. Never work on electrical equipment unless there is at least one other person nearby who is familiar with the operation and hazards of the equipment. That person shall also be competent in giving first aid. Ask maintenance personnel about any hazardous features of the TRH or MBU prior to doing any maintenance. Whenever possible, external power must be shut off before performing any maintenance. Be careful not to contact high-voltage connections when removing, installing or operating this equipment. Whenever possible, keep one hand away from the equipment to reduce the hazard of current flowing through vital organs of the body. Voltages as low as 50 volts may cause death.

For artificial respiration, refer to FM 21-11.

Do not stand in water while handling live power cords or electrical shock may result. Position all power cables so that they are out of the way during operation and are not in water.

7. Connect TRH power cord to coupling on TRH electrical control box (Figure 9, Item 1) and the GFCI outlet (Figure 9, Item 2) on the power inverter.

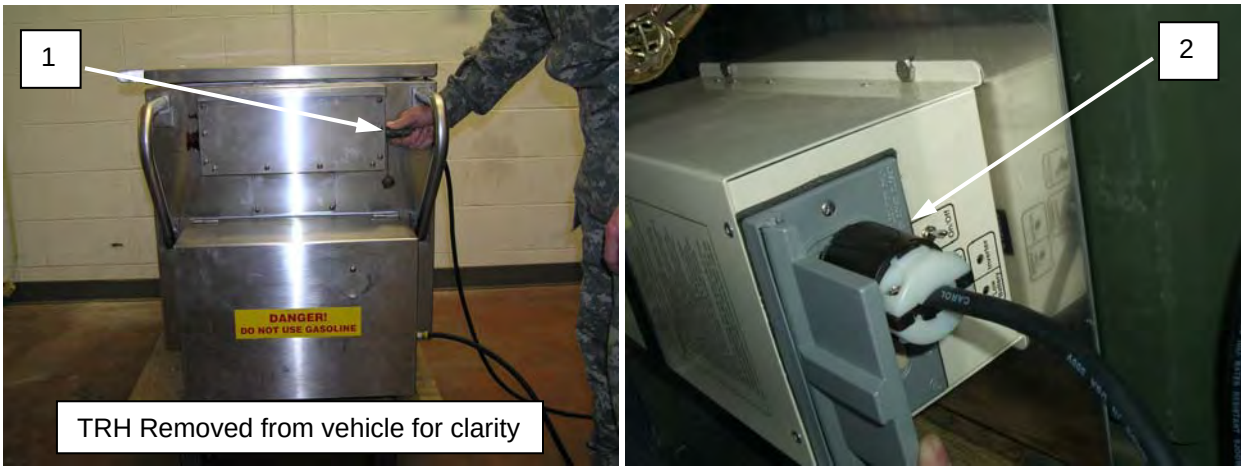


Figure 9. TRH Power Connections.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE

FLAME SAFEGUARD CONTROL REPLACE

INITIAL SETUP:

Tools and Special Tools

Maintenance Kit (WP 0066, Item 1)
Tool Kit (WP 0066, Item 3)

Personnel Required

Food Service Specialist 92G
Food Service Technician 3381

References

WP 0026

Equipment Condition

TRH Burner Cover Removed (WP 0026)

REPLACE

1. Loosen the flame safeguard control integral retaining screw (Figure 1, Item 1).
2. Remove the flame safeguard control box (Figure 1, Item 2).
3. Replace the flame safeguard control box (Figure 1, Item 2) with serviceable item from stock and tighten the integral retaining screw (Figure 1, Item 1).

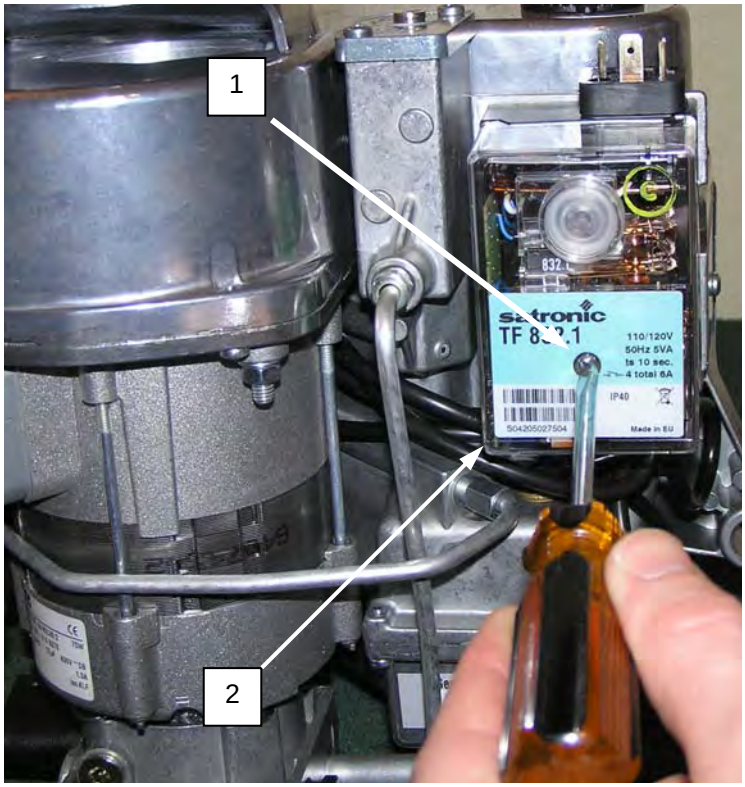


Figure 1. Flame Safeguard Control Replacement.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE

PHOTO SEMICONDUCTOR DEVICE
REPLACE

INITIAL SETUP:

Personnel Required	Equipment Condition
Food Service Operator 92G (1) Food Service Technician 3381 (1)	TRH Burner removed from TRH (WP 0026)

REPLACE

1. Remove photocell (Figure 1, Item 1) by pulling straight out from photocell base (Figure 1, Item 2).
2. Remove photocell standoff (Figure 1, Item 3) by sliding off photocell, do not misplace.

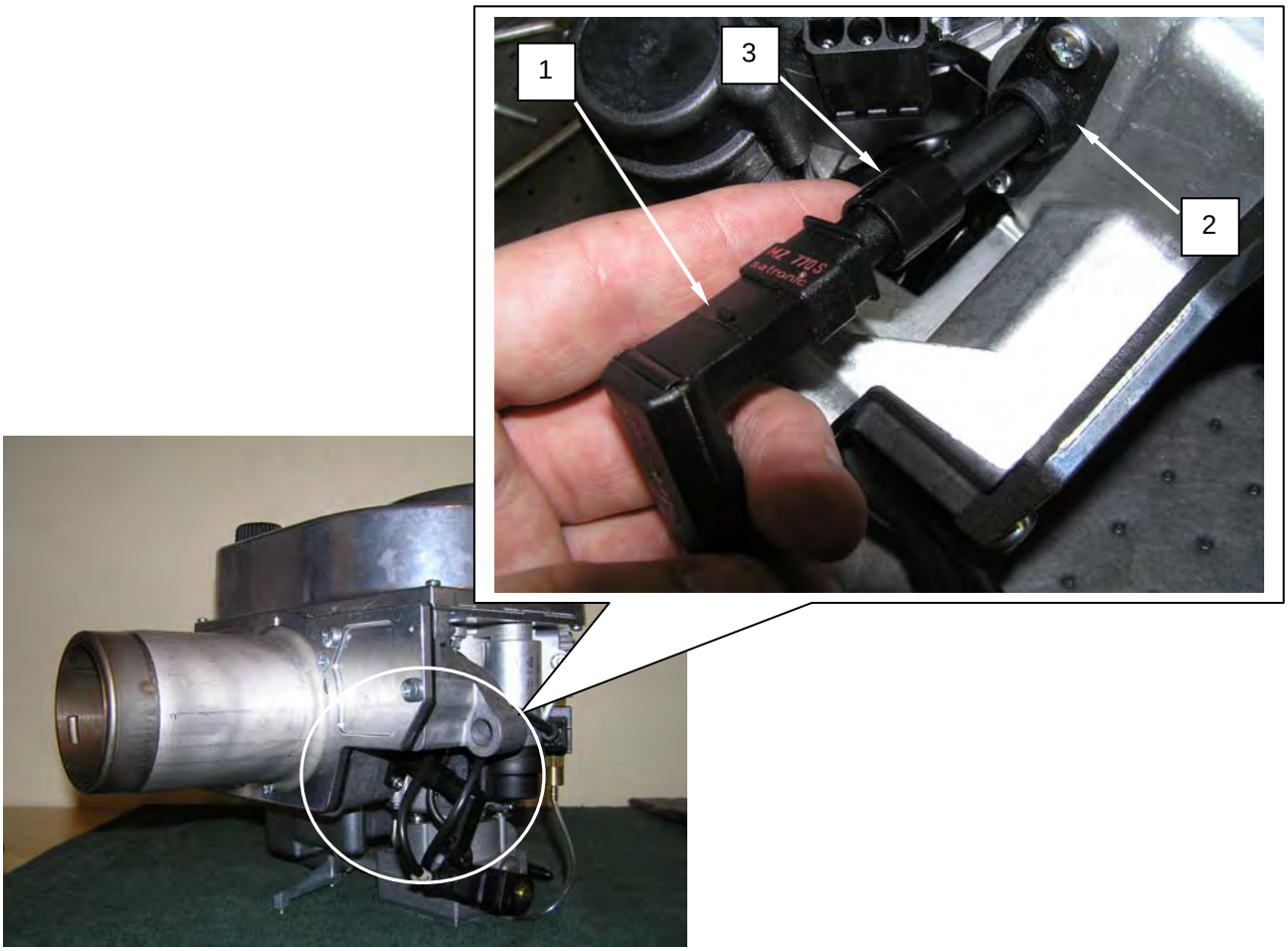


Figure 1. Removing the Photocell.

REPLACE - CONTINUED

3. Disconnect photocell from power cable by pressing down on photocell release (Figure 2, Item 1) and pulling photocell (Figure 2, Item 2) away from photocell power cable (Figure 2, Item 3).

4. Connect new photocell to power cable by pressing down on photocell release (Figure 2, Item 1) and sliding photocell (Figure 2, Item 2) onto photocell power cable (Figure 2, Item 3). Ensure light detector (Figure 2, Item 4) on photocell is pointing away from the photocell power cable (Figure 2, Item 3).

5. Slide photocell standoff (Figure 2, Item 5) over new photocell. Align tab on photocell standoff with notch on photocell.

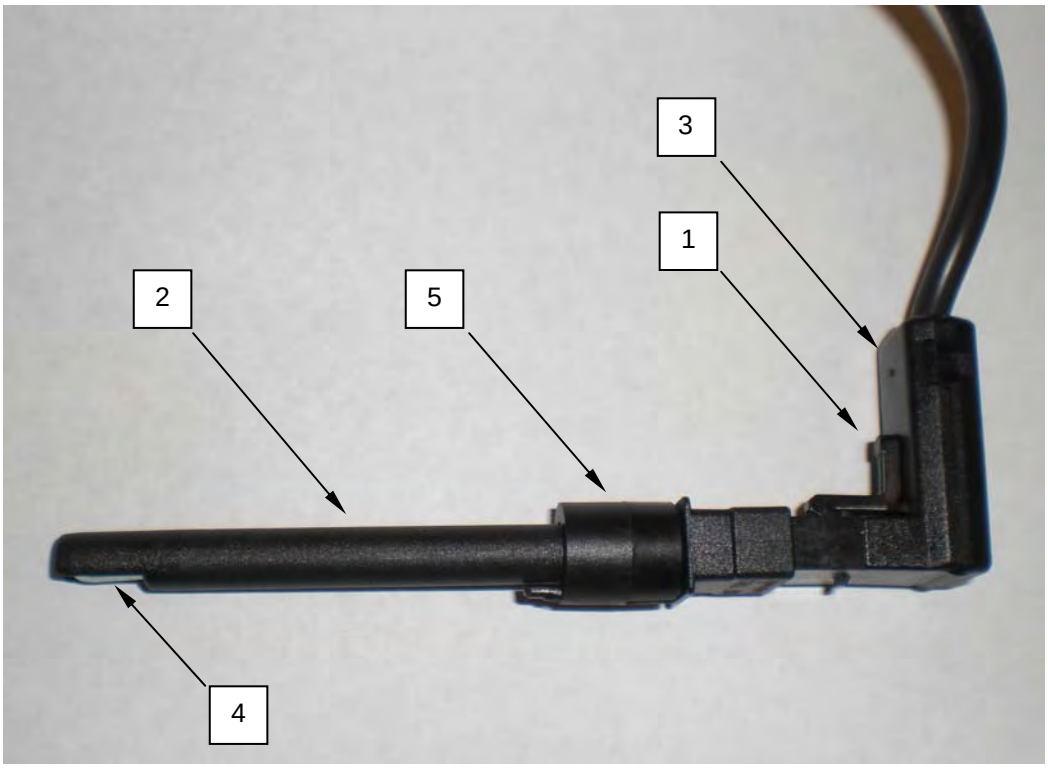


Figure 2. Photocell to Power Cable Connection.

REPLACE – CONTINUED

6. Insert photocell (Figure 3, Item 1) into TRH burner by sliding into photocell base (Figure 3, Item 2), aligning tab on photocell standoff with notch on photocell base at 9 o'clock position, and orienting so that the light detector window of the photocell is facing the TRH burner flame tube (Figure 3, Item 3) as shown in Figure 3.

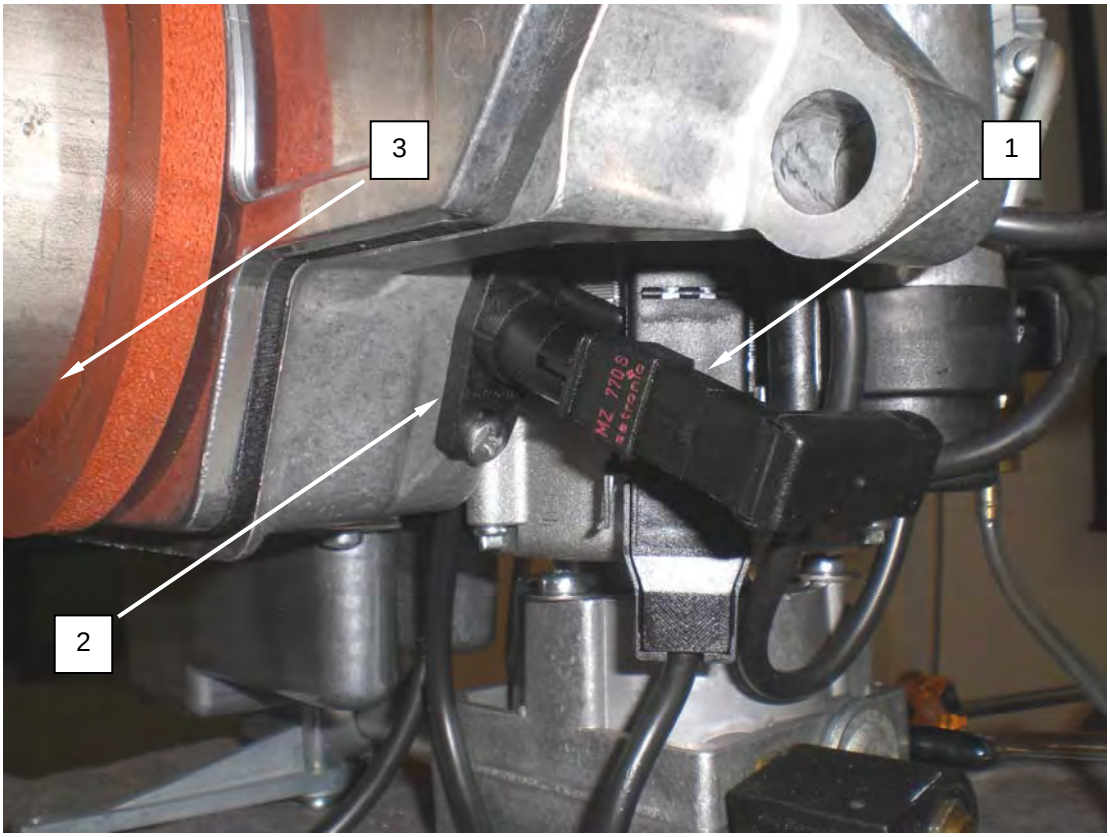


Figure 3. Photocell Orientation.

END OF TASK

END OF WORK PACKAGE

SERVICE MAINTENANCE

FOOD AND BEVERAGE CONTAINERS
REPAIR

INITIAL SETUP:

Tools and Special Tools	Personnel Required
Maintenance Kit (WP 0066, Item 1)	Food Service Operator 92G (1)
Tool Kit (WP 0066, Item 3)	Food Service Technician 3381 (1)

REPAIR

Repair procedures in this WP apply to any AK food service container that uses screws as attaching hardware only. Older style containers may be encountered with rivets as attaching hardware. Any AK food service container requiring repair that has rivets as attaching hardware will be referred to the next higher level of maintenance for repair.

Vent Cap Replacement

This procedure covers replacement of unserviceable vent caps for the Insulated Beverage Dispenser, IFC, and SLPC.

NOTE

SLPC is depicted in Figure 1. Replacement procedures for IFC and IBC are the same.

1. Pull vent cap (Figure 8, Item 1) away from SLPC door by hand.
2. Align the replacement cap (Figure 8, Item 1) and press fit to container by hand.

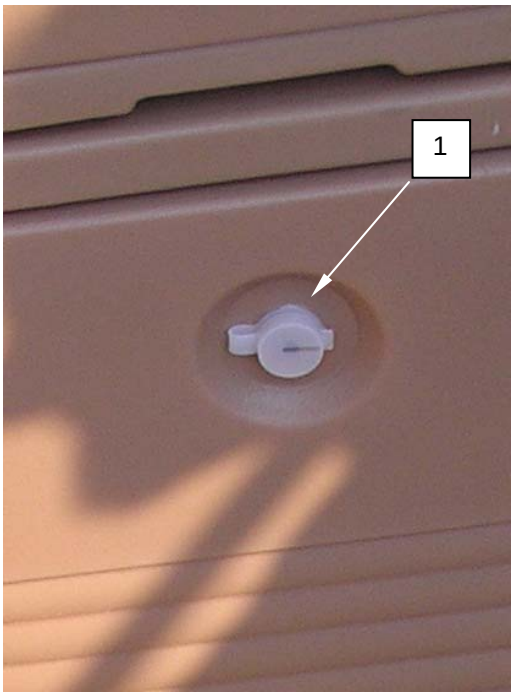


Figure 1. Vent Cap Replacement.

REPAIR - CONTINUED

Insulated Beverage Dispensers Repair

Repair of the Insulated Beverage Dispenser will consist of replacement of an unserviceable lid gasket, latch assembly, vent cap, or faucet and spout assembly.

Lid Gasket Replacement.

1. Remove the lid (Figure 2, Item 2) from the beverage dispenser (Figure 2, Item 1).
2. Pull the lid gasket (Figure 2, Item 3) off the lid by hand.
3. Align the replacement gasket (Figure 2, Item 3) and press fit to lid by hand.

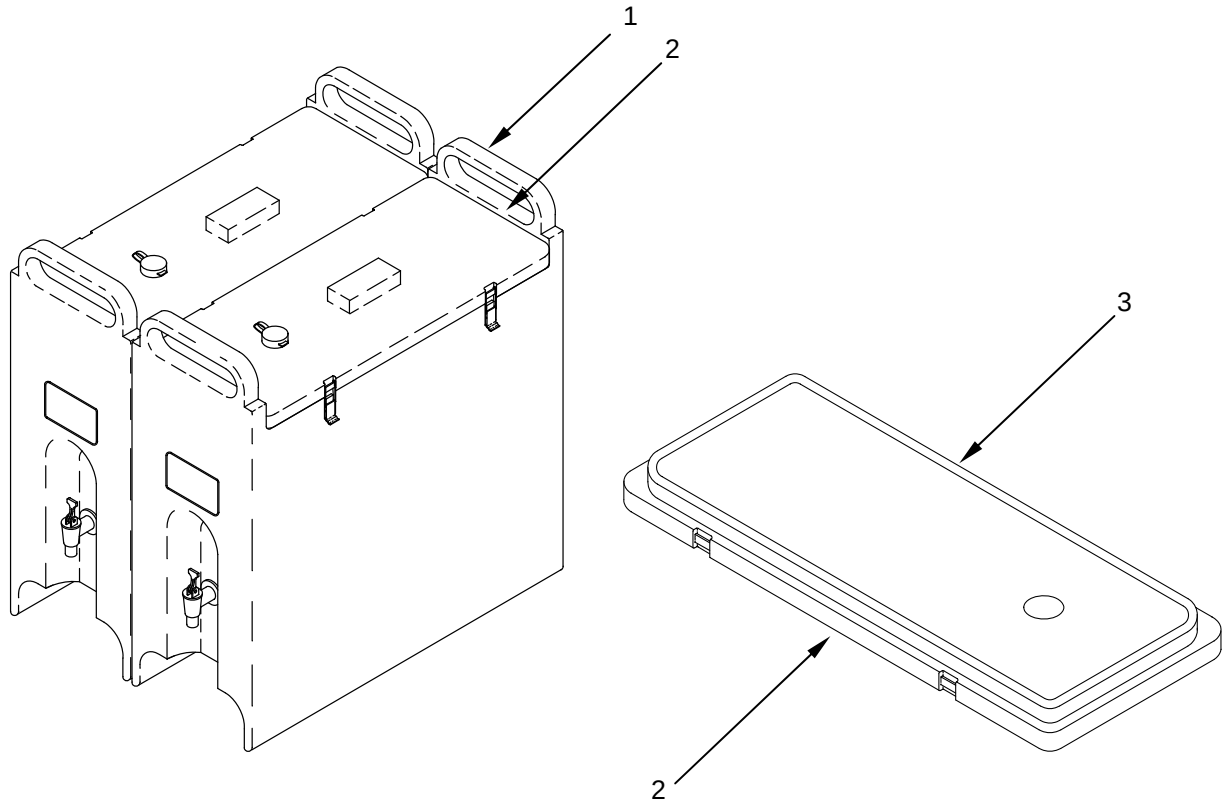


Figure 2. Insulated Beverage Dispenser.

END OF TASK

REPAIR - CONTINUED

Latch Assembly Replacement.

1. Remove two screws (Figure 3, Item 2) from the dispenser lid latch assembly (Figure 3, Item 1).

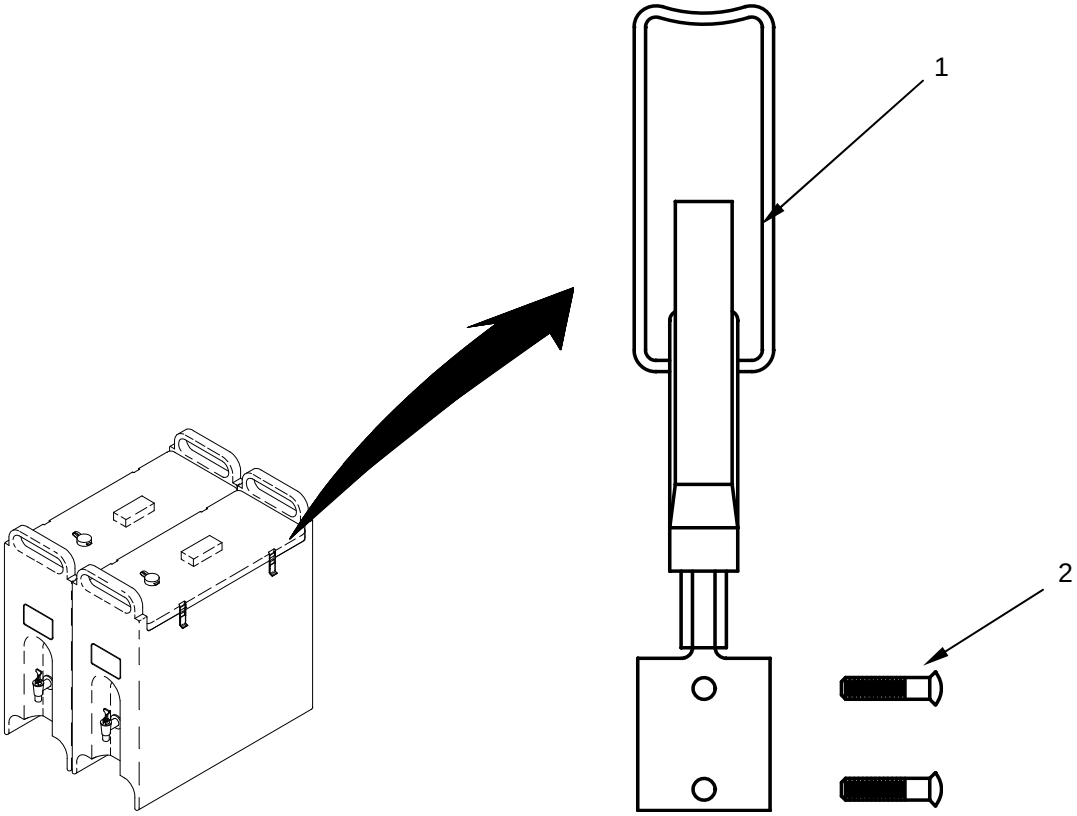


Figure 3. Beverage Dispenser Lid Latch.

2. Remove latch assembly (Figure 3, Item 1) from dispenser.
3. Align replacement lid latch (Figure 3, Item 1) with two holes in dispenser.
4. Install and tighten two screws (Figure 3, Item 2) to secure lid latch (Figure 3, Item 1) to dispenser.

END OF TASK

REPAIR – CONTINUED

Faucet and Spout Assembly Replacement.

1. Loosen the wing nut (Figure 4, Item 4) and remove the faucet (Figure 4, Item 8) from the spout (Figure 4, Item 1).

2. Loosen cap (Figure 4, Item 6) from top of faucet (Figure 4, Item 8) and remove silicone rubber seal cup (Figure 4, Item 7).

3. Remove “C” nut (Figure 4, Item 5) and wing nut (Figure 4, Item 4) from spout (Figure 4, Item 1).

4. Remove hex nut (Figure 4, Item 3), spout (Figure 4, Item 1), and O-ring (Figure 4, Item 2).

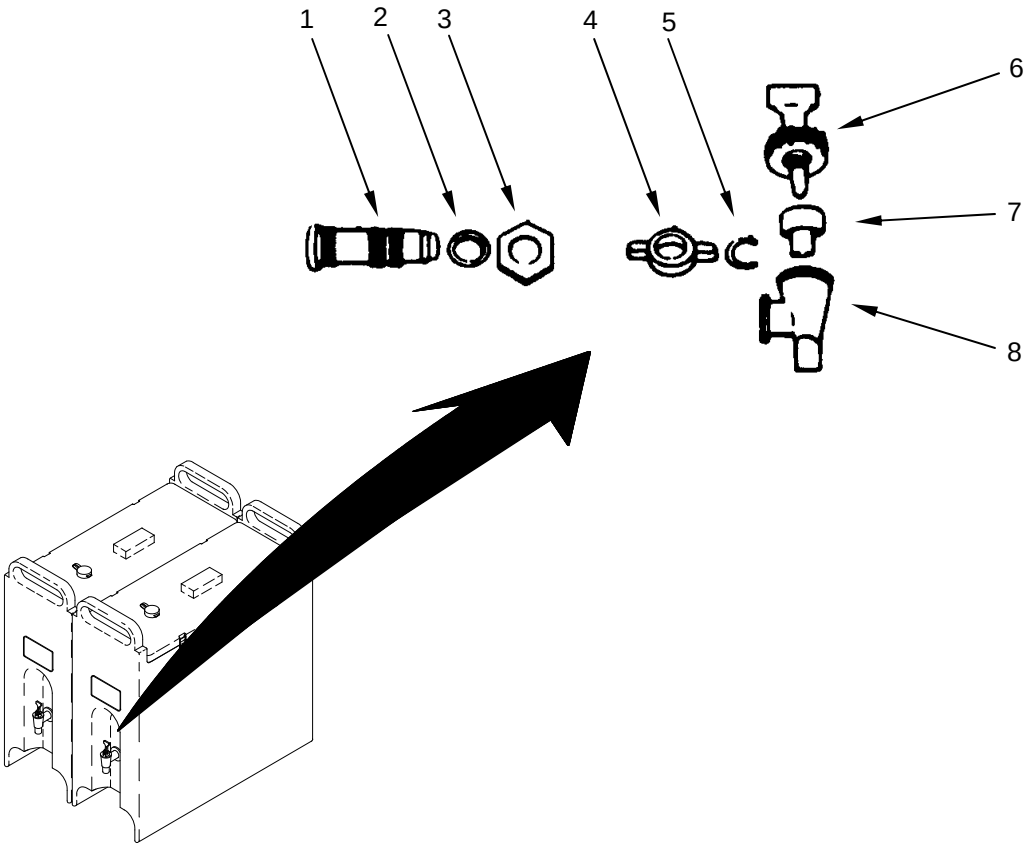


Figure 4. Dispenser Faucet and Spout Assembly.

5. Install spout (Figure 4, Item 1) and O-ring (Figure 4, Item 2) from the inside through dispenser wall.

6. Install hex nut (Figure 4, Item 3) and tighten.

7. Install wing nut (Figure 4, Item 4) and “C” nut (Figure 4, Item 5).

8. Install silicone rubber seal cup (Figure 4, Item 7) and install top on faucet (Figure 4, Item 8) and tighten.

9. Install faucet (Figure 4, Item 8) to the spout (Figure 4, Item 1) and tighten wing nut (Figure 4, Item 4).

END OF TASK

REPAIR – CONTINUED

Side Loading Pan Carrier Repair

Repair of the Side Loading Pan Carrier consists of replacement of the door gasket, hinge door, or vent cap.

Door Gasket Replacement.

1. Open the door of the SLPC.
2. Pull the lid gasket (Figure 5, Item 1) off the door by hand.
3. Align the replacement gasket (Figure 5, Item 1) and press fit to door by hand.

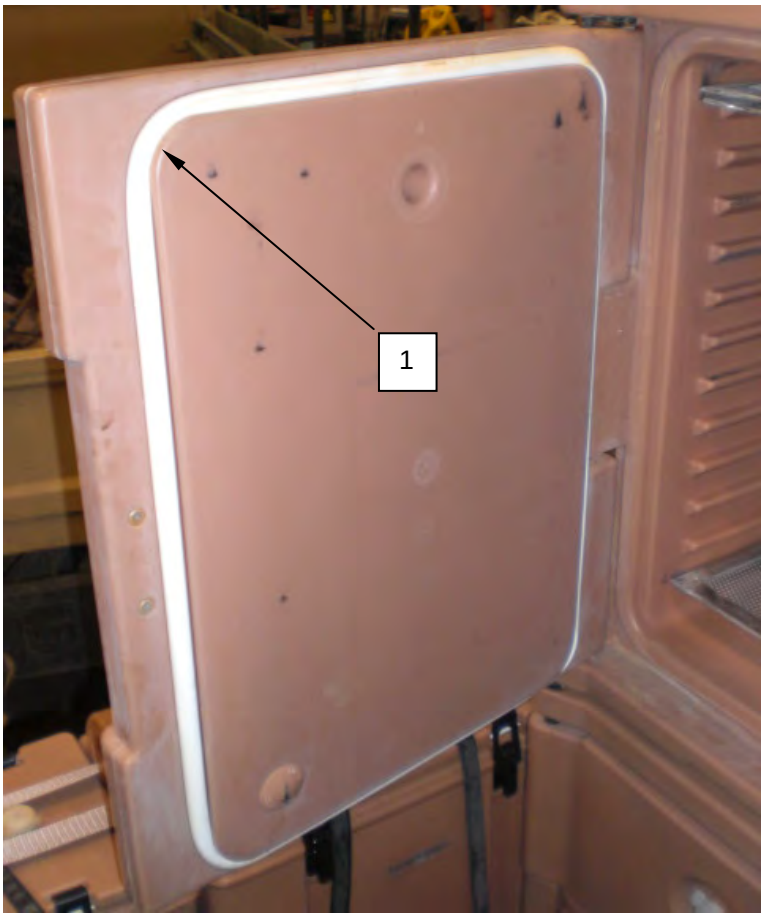


Figure 5. SLPC Door Gasket Replacement.

END OF TASK

REPAIR – CONTINUED

Hinge Replacement.

1. Open the door of the SLPC.
2. Remove the five screws from the hinge (Figure 6, Item 1) and set aside screws.
3. Remove the hinge (Figure 6, Item 1).
4. Align the replacement hinge (Figure 6, Item 1) to the SLPC and secure hinge with five screws.

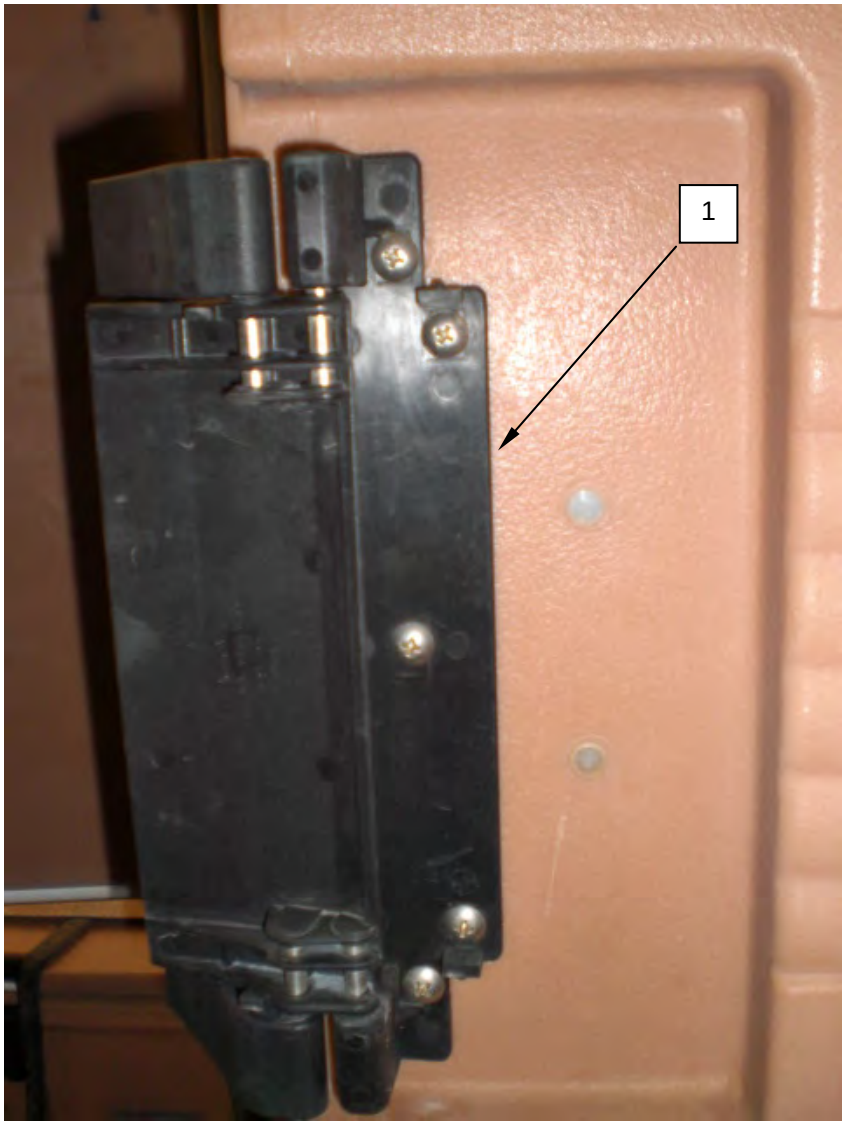


Figure 6. SLPC Hinge Replacement.

END OF TASK

REPAIR – CONTINUED

Door Replacement.

1. Open the door of the SLPC.
2. Remove the door pin retainer (Figure 7, Item 1) by prying pin downward and rotating away from locking tab retainer on SLPC body.
3. When the door pin retainer (Figure 7, Item 1) is exposed, pull it away from the door pin by hand and set aside.
4. Slide door pin (Figure 7, Item 2) straight out of door and set aside.
5. Repeat steps 2, through 4, for opposite end of door.
6. Align replacement door and secure to SLPC by replacing door pins (Figure 7, Item 2) and retainers (Figure 7, Item 1) on top and bottom of door.

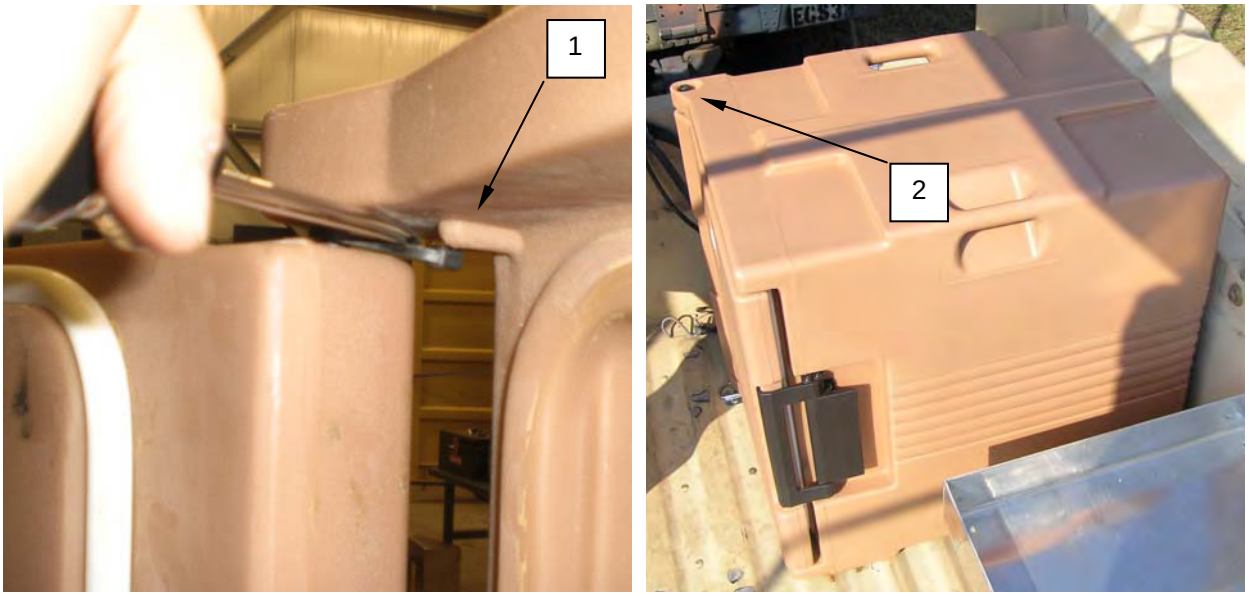


Figure 7. SLPC Door Replacement.

END OF TASK

REPAIR – CONTINUED

Insulated Food Carrier Repair

Repair of the Insulated Food Carrier consists of replacing the hinges.

Hinge Replacement.

1. Remove the lid (Figure 8, Item 1) from the IFC (Figure 8, Item 2).
2. Remove the three screws from the hinge (Figure 8, Item 3) and set aside screws.
3. Remove the hinge (Figure 8, Item 3).
4. Align the replacement hinge (Figure 8, Item 3) to the IFC, and secure with three screws.

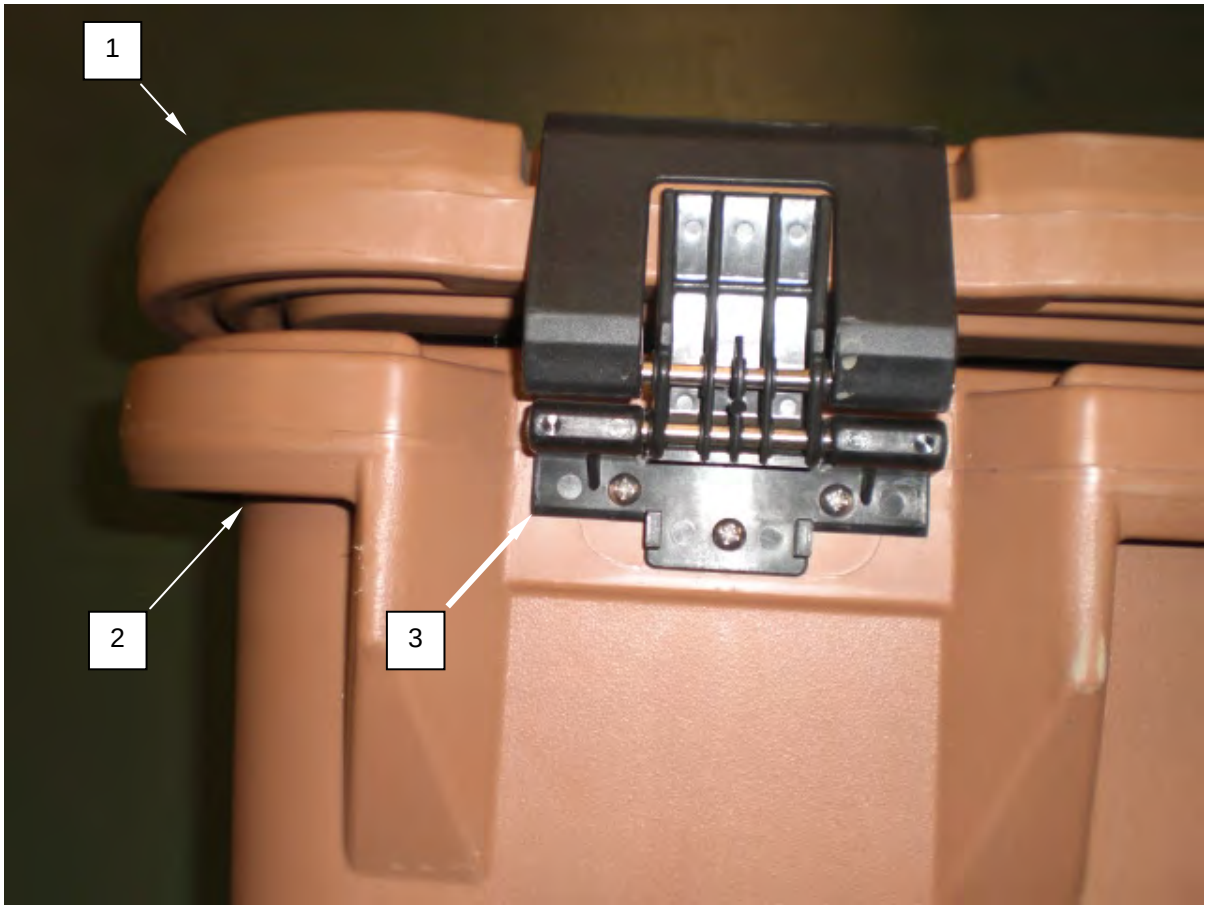


Figure 8. IFC Hinge Replacement.

END OF TASK

REPAIR – CONTINUED

Ice Storage Chest Repair

Repair of the Ice Storage Chest consists of replacing the stationary lid or faucet drain assembly.

Lid Replacement.

1. Remove the stationary lid (Figure 9, Item 1) by loosening four thumb screws (Figure 9, Item 2) and lifting stationary lid away from ice chest (Figure 9, Item 3).

2. Align replacement stationary lid (Figure 9, Item 1) and secure to ice chest (Figure 9, Item 3) with thumb screws (Figure 9, Item 2).

Figure 9. Ice Chest Lid Replacement.

END OF TASK

REPAIR – CONTINUED

Faucet Drain Assembly Replacement.

1. Loosen the nut (Figure 10, Item 1) and remove the faucet drain assembly (Figure 10, Item 2) from the ice chest (Figure 10, Item 3).

2. Align replacement drain assembly (Figure 10, Item 2) to ice chest (Figure 10, Item 3) and secure with nut (Figure 10, Item 1).

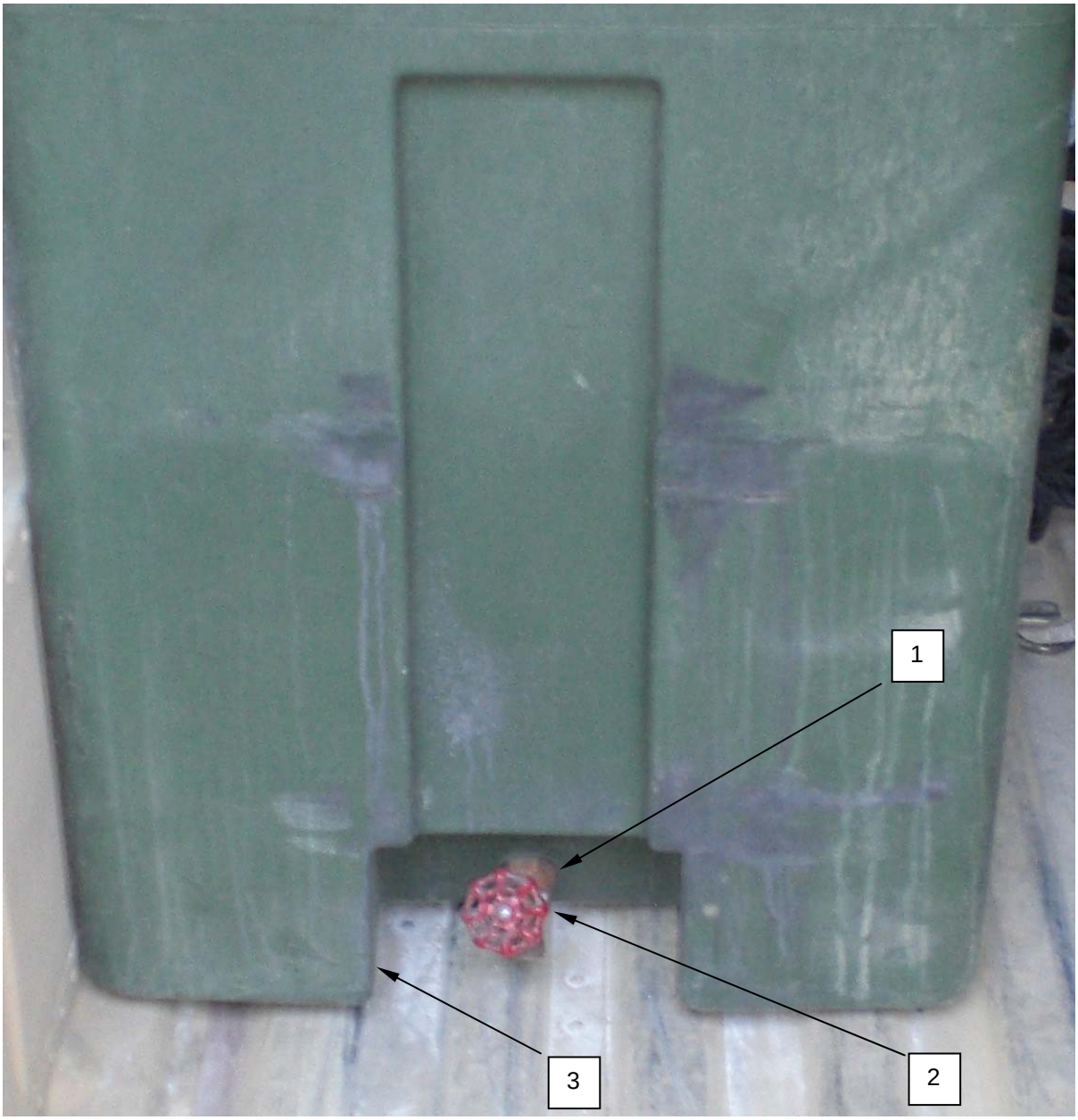


Figure 10. Ice Chest Repair.

END OF TASK

END OF WORK PACKAGE

CHAPTER 7

SERVICE MAINTENANCE INSTRUCTIONS FOR ASSAULT KITCHEN

SERVICE MAINTENANCE

FLANGE MOUNT (MARINE CORPS ONLY) REPLACE

INITIAL SETUP:

Tools and Special Tools

Maintenance Kit (WP 0066, Item 1)
Tool Kit (WP 0066, Item 3)

Personnel Required

Food Service Technician 3381

Equipment Condition

TRH Burner removed from TRH (WP 0026)
Power disconnected from TRH

REPLACE

1. Remove the two retaining nuts (Figure 1, Item 1) from the flange plate (Figure 1, Item 2).
2. Remove and discard nuts (Figure 1, Item 1), washers, and the aluminum flange (Figure 1, Item 2) from the TRH.
3. Inspect the flange mounting surface of the tank to ensure it is clean and free of damage.

Figure 1. Removing the Flange Mounting Bracket (Marine Corps Only).

REPLACE - CONTINUED

4. Assemble the replacement flange (Figure 2, Item 1) by sliding the white fibrous gasket (Figure 2, Item 2) over the cone up to the mounting ears. Ensure that it is sitting flush with the outer rim of the new flange.

5. Insert the new flange (Figure 2, Item 1) into the tank cone first and slide the ears over the protruding bolt studs. Center the flange between the studs (Figure 2, Item 3).

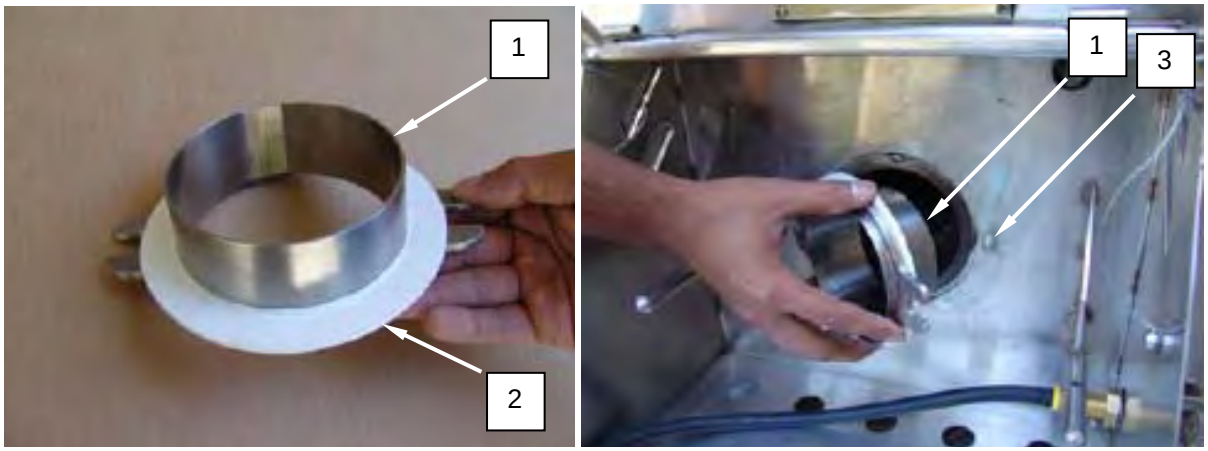


Figure 2. Replacement Flange Mounting (Marine Corps Only).

6. Place one of the provided brass nuts (Figure 3, Item 1) on each stud. Turn clockwise and tighten to seat the new flange. Ensure that the flange is centered between the studs and is even with the mounting surface (Figure 3, Item 2).

7. Tighten the two nuts, being careful not to over tighten (Figure 3, Item 1).

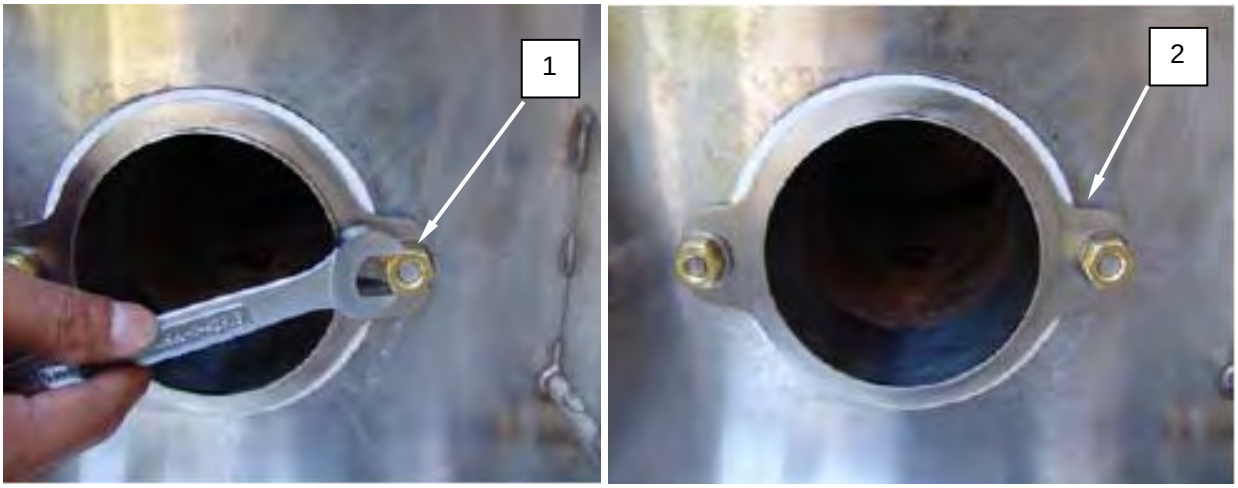


Figure 3. Securing the Replacement Flange (Marine Corps Only).

REPLACE - CONTINUED

8. Remove the red high temperature gaskets (Figure 4, Item 1) from the modification kit, place one over the air tube of the burner from the TRH tank, and slide down flush against the burner body (Figure 4, Item 2). Do the same for the spare burner in the maintenance kit. Store the third gasket with the repair parts in the maintenance kit box.

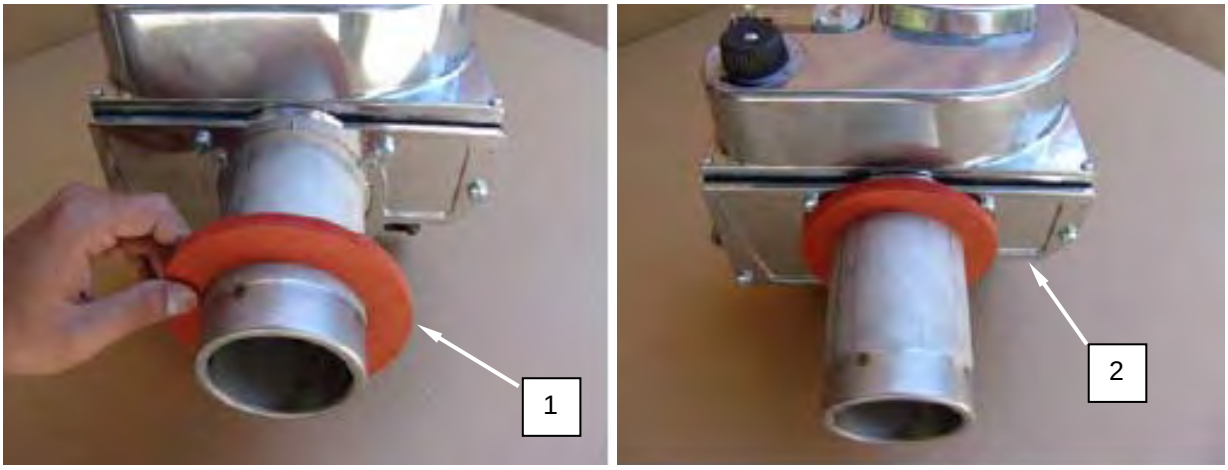


Figure 4. High Temperature Gasket Placement (Marine Corps Only).

END OF TASK

END OF WORK PACKAGE

SERVICE MAINTENANCE

TOGGLE SWITCH
REPLACE

INITIAL SETUP:

Tools and Special Tools	**Personnel Required**
General Mechanic's Tool Kit: Automotive (GMTK) (WP 0066, Item 4)	Quartermaster Equipment Repairer 63J (1) Food Service Technician 3381 (1)
Materials/Parts	**Equipment Condition**
Activated Desiccant (WP 0065, Item 5)	Power disconnected from TRH

REPLACE

1. Remove primary TRH electrical control panel cover (Figure 1, Item 1) by removing 10 screws. Retain screws.

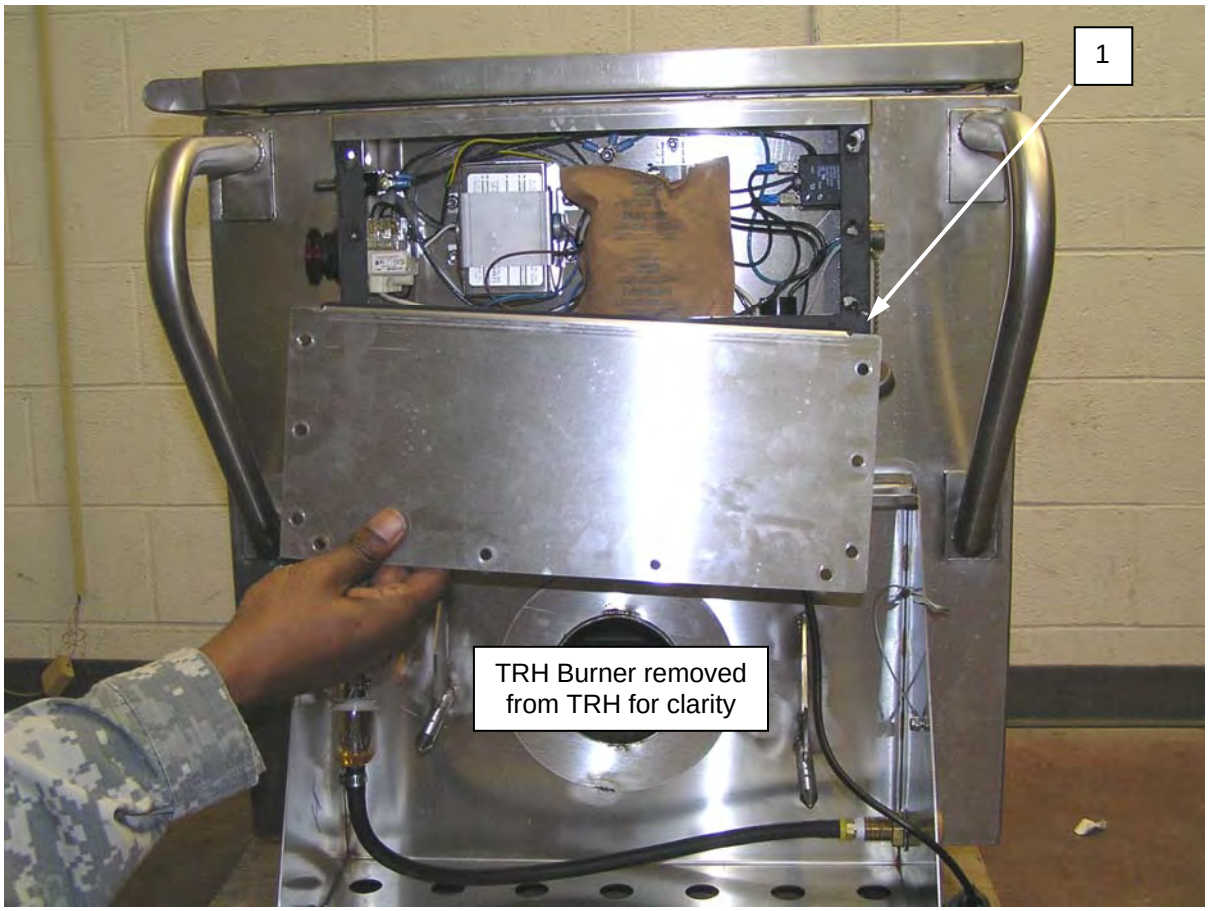


Figure 1. Access Cover Removal.

REPLACE - CONTINUED

2. Remove toggle switch retaining nut (Figure 2, Item 1) and rubber boot.

NOTE

Prior to removing switch, note proper orientation for reinstallation.

3. Remove toggle switch from control box.

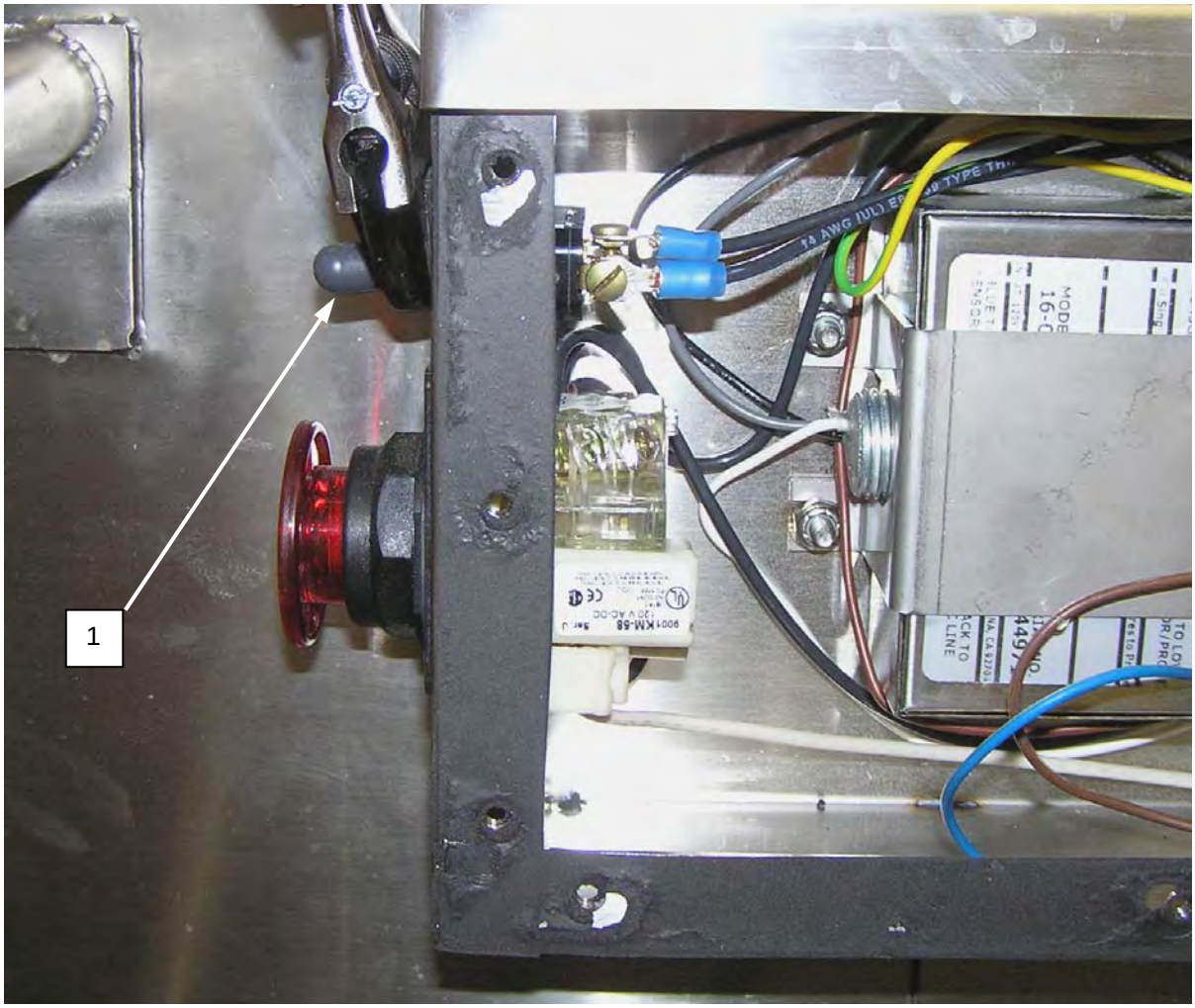


Figure 2. Toggle Switch Removal.

REPLACE – CONTINUED

CAUTION

Failure to ensure proper wire connection could result in improper equipment indications.

4. Transfer wires one at a time, from the terminals on the defective toggle switch (Figure 3, Item 1) to the terminals (Figure 3, Item 2) on the replacement toggle switch, being careful to maintain proper wire connectivity.

5. Install replacement toggle switch (Figure 3, Item 1), retaining nut, and rubber boot.

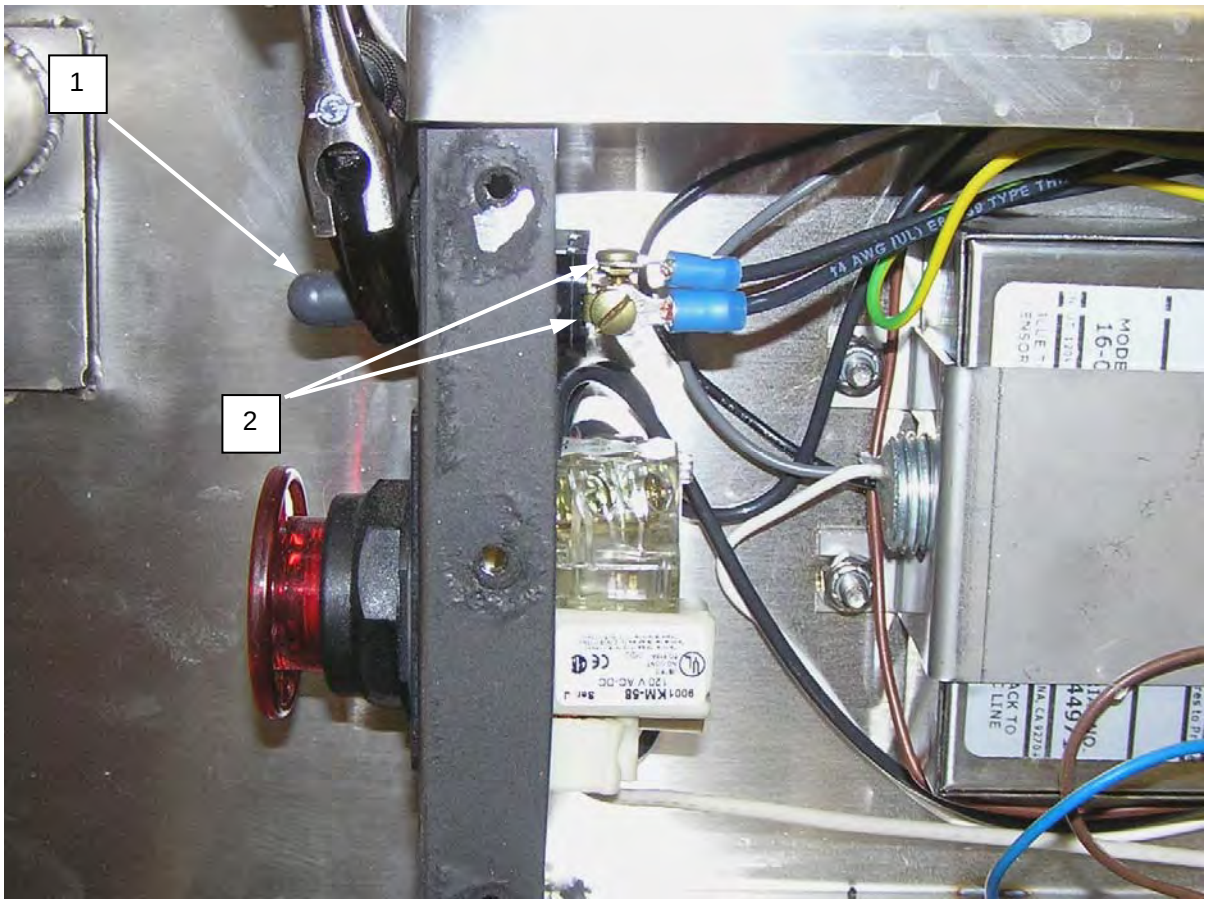


Figure 3. Toggle Switch Replacement.

REPLACE – CONTINUED

NOTE

The desiccant bag is used to protect electrical components by absorbing moisture. If moisture is present in electrical control panel, the desiccant has become saturated and needs replacing. Replace with a new desiccant bag.

6. Replace desiccant bag (Figure 4, Item 1).

7. Install primary control panel access cover (Figure 4, Item 2).

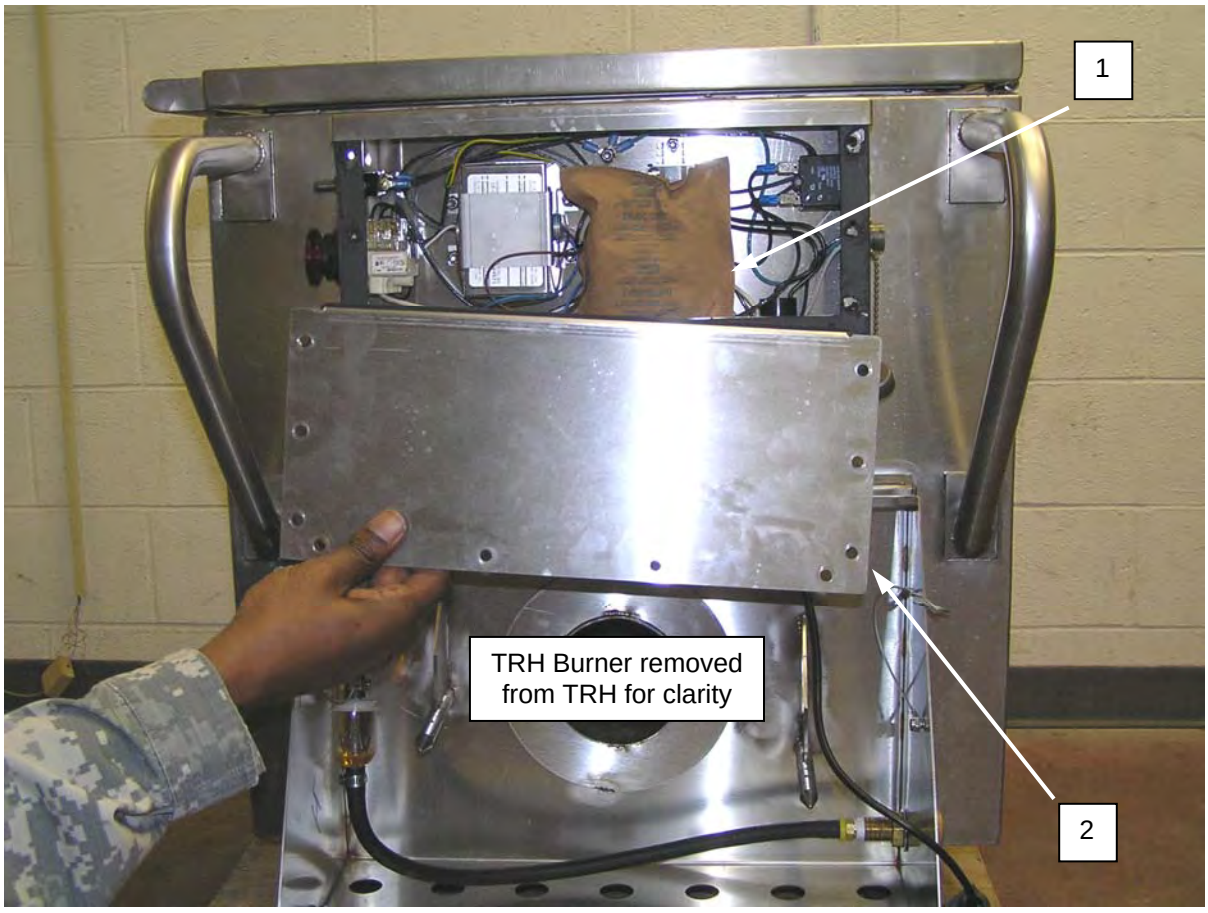


Figure 4. Access Cover Replacement.

END OF TASK

END OF WORK PACKAGE

SERVICE MAINTENANCE

PUSH-PULL LIGHT SWITCH
REPAIR, REPLACE

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit: Automotive (GMTK) (WP 0066, Item 4)

Personnel Required

Quartermaster Equipment Repairer 63J (1)
Food Service Technician 3381 (1)

Materials/Parts

Activated Desiccant (WP 0065, Item 5)

Equipment Condition

TRH Burner removed from TRH (WP 0026)
Power disconnected from TRH

REPAIR

Repair of 120 V push-pull light switch will consist of replacing a defective light bulb.

1. Unscrew red push-pull light switch control knob cover (Figure 1, Item 1).

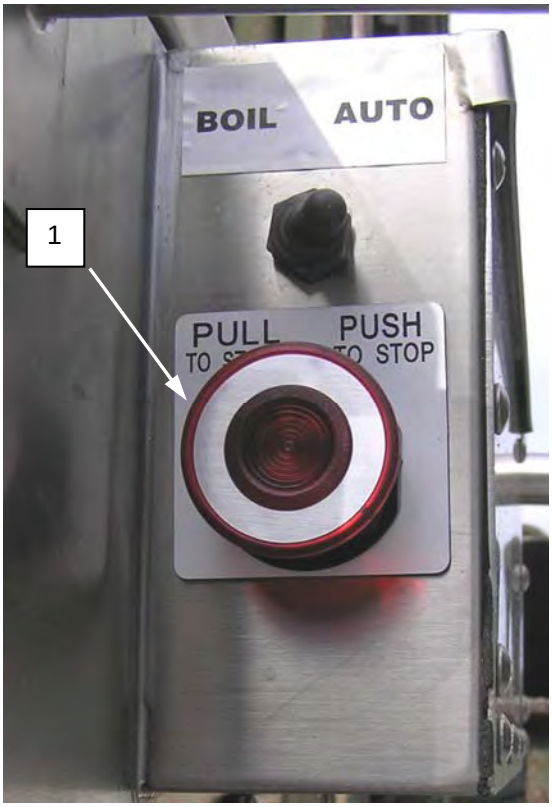


Figure 1. Pull-On/Push-Off Switch.

REPAIR - CONTINUED

2. Push and twist light bulb (Figure 2, Item 1) with thumb and forefinger 1/8-turn clockwise or until bulb pops out.

3. Insert new light bulb (Figure 2, Item 1) into socket (Figure 2, Item 2) and push and turn until seated.

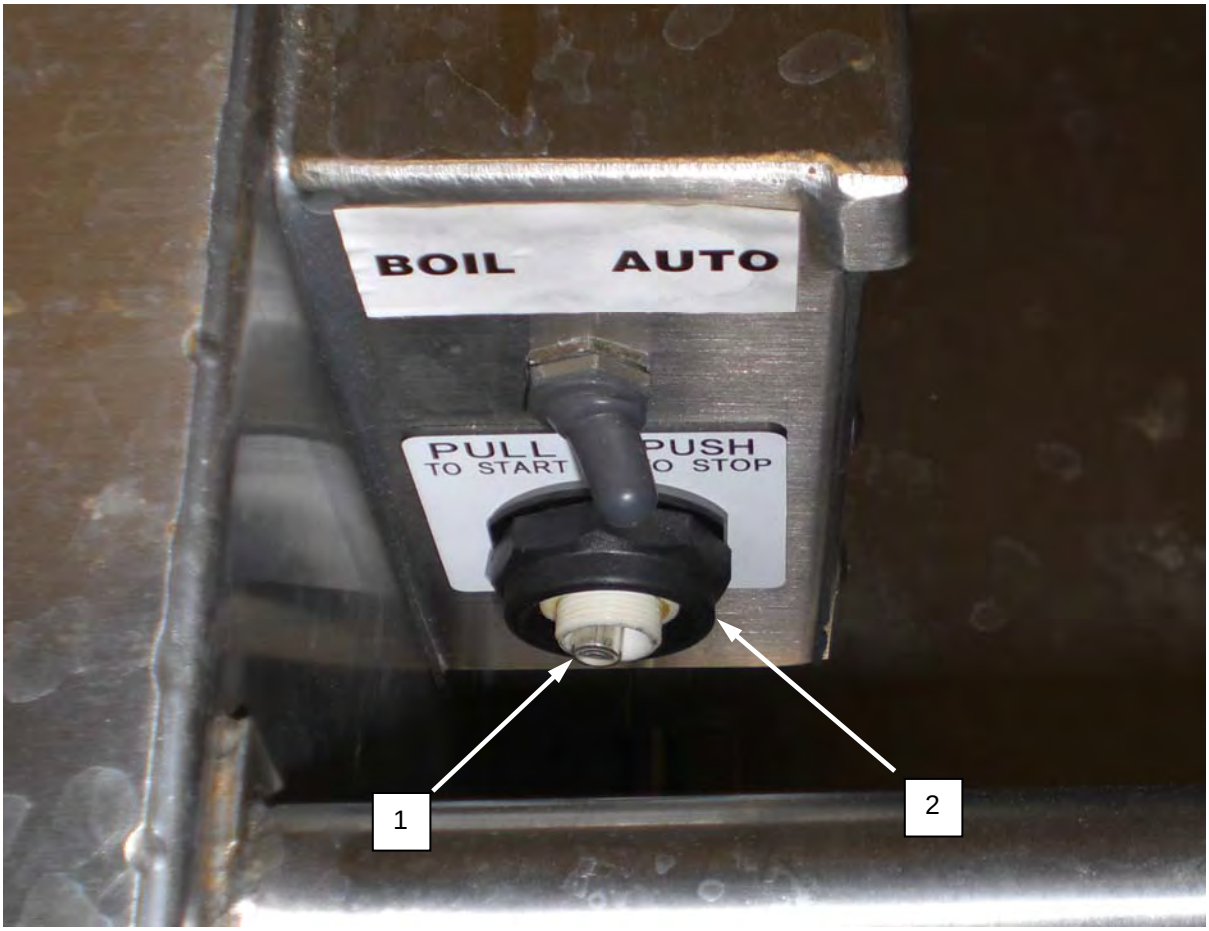


Figure 2. Pull-On/Push-Off Switch Bulb Replace.

4. Screw on red push-pull light switch control knob cover.

END OF TASK

REPLACE

1. Remove primary TRH electrical control panel cover (Figure 3, Item 1) by removing 10 screws. Retain screws.

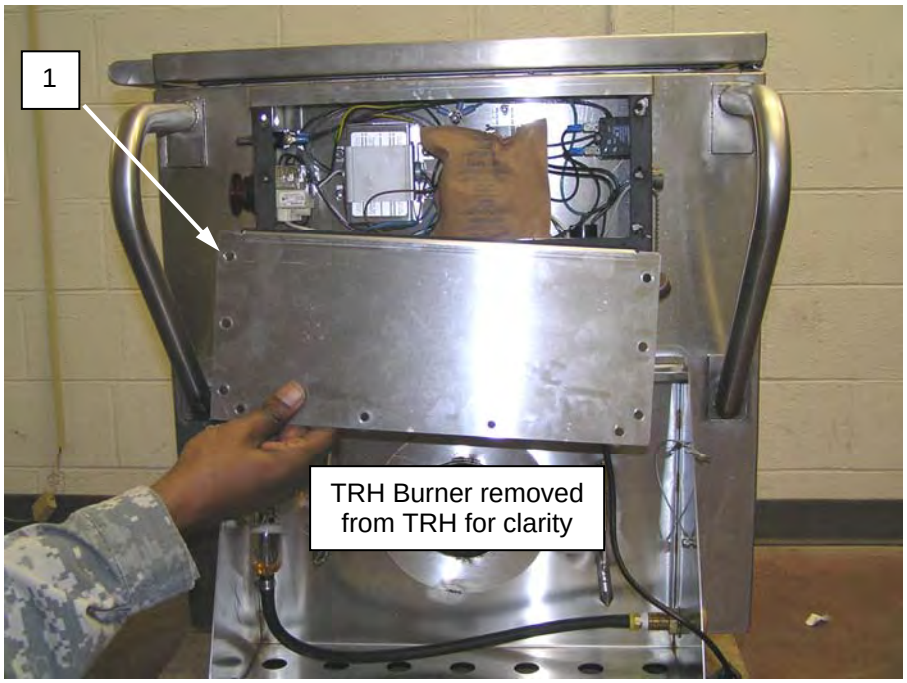


Figure 3. Access Cover Removal.

2. Unscrew red push-pull light switch control knob cover and remove.

3. Remove push-pull light switch retaining nut and plastic spacers.

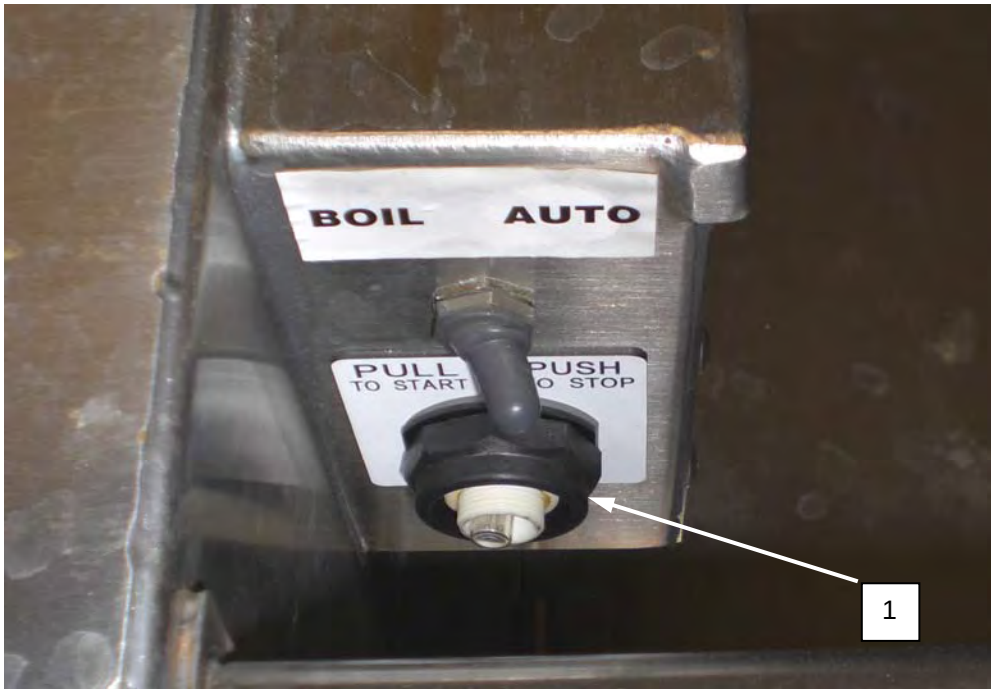


Figure 4. Pull-On/Push-Off Light Switch Retaining Nut.

REPLACE – CONTINUED

4. Remove push-pull light switch from control box and retain indicator plate.
5. Transfer wires one at a time, from the terminals on the defective switch, to the terminals on the replacement switch (Figure 5, Item 1).
6. Install replacement switch in control box.
7. Install indicator control plate, plastic spacers, and retaining nut.
8. Screw on red push-pull light switch control knob cover.

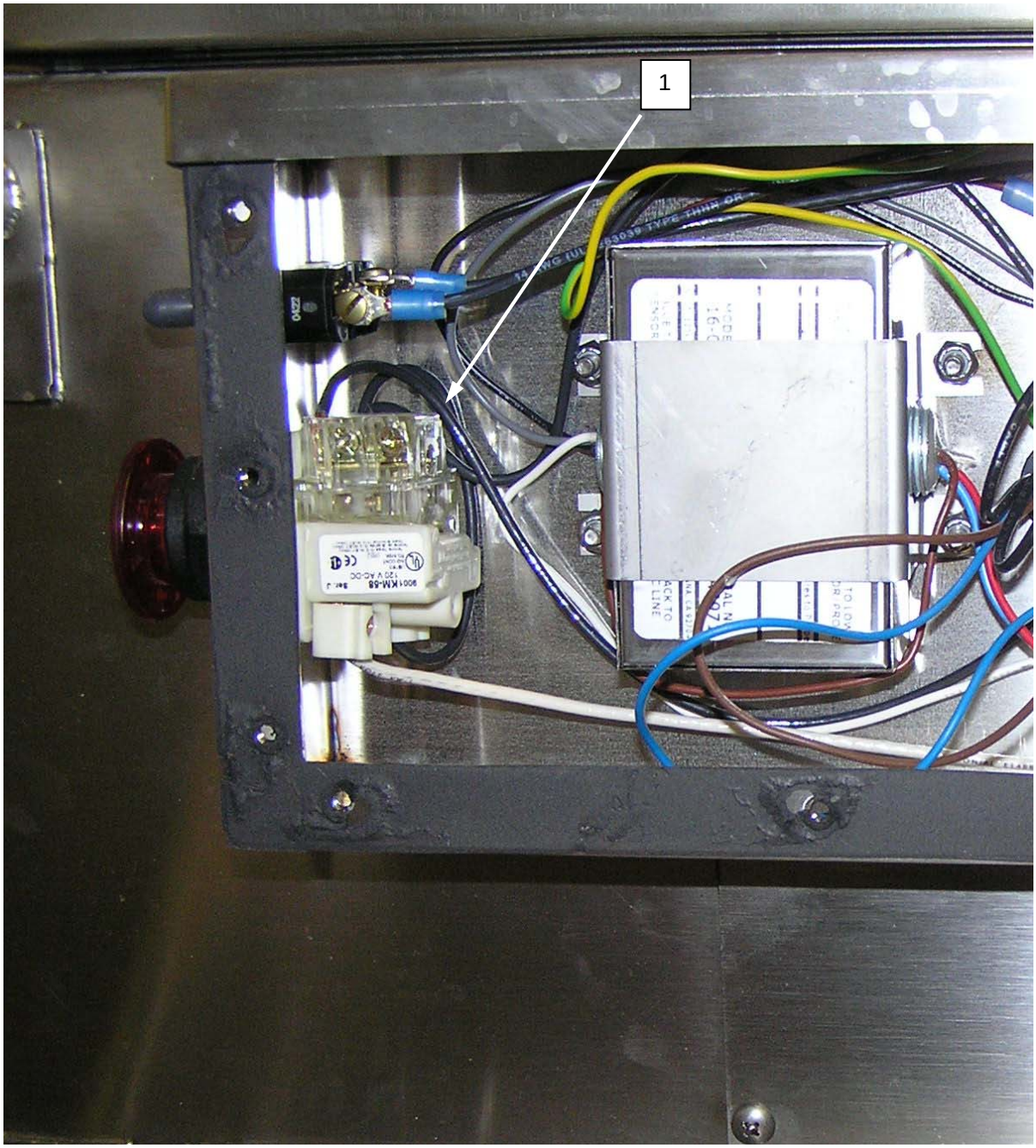


Figure 5. Pull-On/Push-Off Switch Replacement.

REPLACE - CONTINUED

NOTE

The desiccant bag is used to protect electrical components by absorbing moisture. If moisture is present in electrical control panel, the desiccant has become saturated and needs replacing. Replace with a new desiccant bag, if required.

9. Ensure desiccant bag (Figure 6, Item 1) is in place inside control panel before replacing control panel cover.

10. Install control panel cover (Figure 6, Item 2), and retain with screws

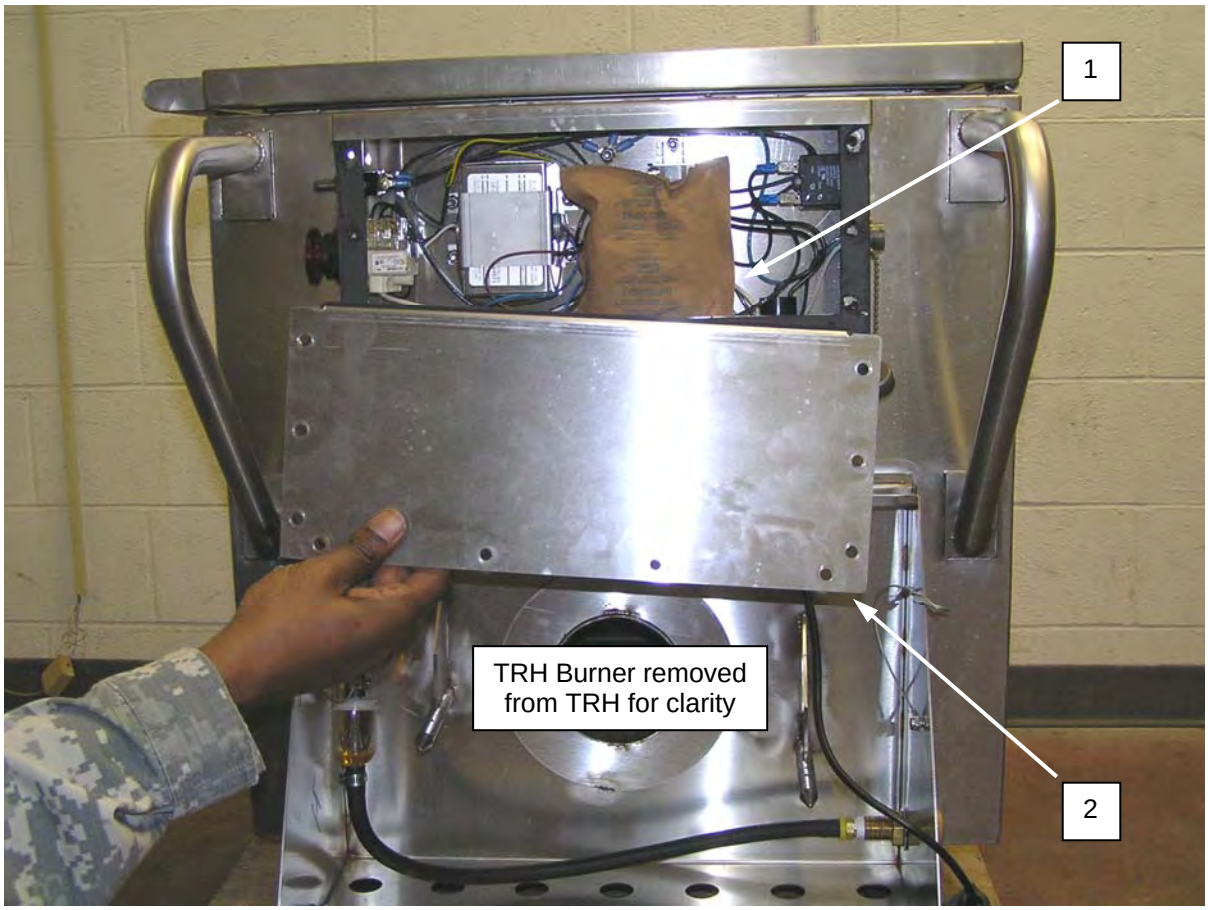


Figure 6. Access Cover Replacement.

END OF TASK

END OF WORK PACKAGE

SERVICE MAINTENANCE

CIRCUIT BREAKER
REPLACE

INITIAL SETUP:

Tools and Special Tools	**Personnel Required**
General Mechanic's Tool Kit: Automotive (GMTK) (WP 0066, Item 4)	Quartermaster Equipment Repairer 63J (1) Food Service Technician 3381 (1)
Materials/Parts	**Equipment Condition**
Activated Desiccant (WP 0065, Item 5)	Power disconnected from TRH

REPLACE

1. Remove primary TRH electrical control panel cover (Figure 1, Item 1) by removing 10 screws. Retain screws. Remove desiccant bag (Figure 1, Item 2).

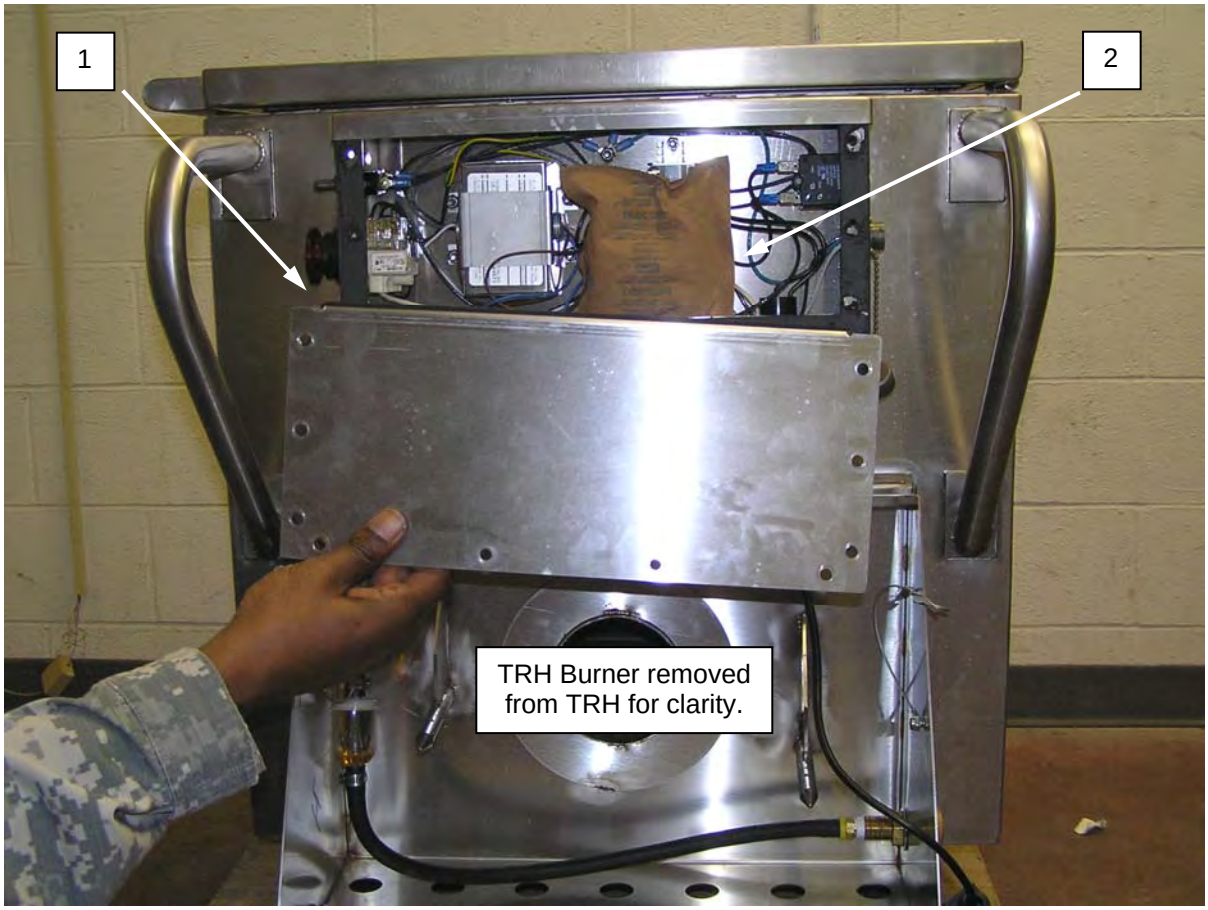


Figure 1. Access Cover Removal.

REPLACE - CONTINUED

2. Remove 5-amp circuit breaker reset switch retaining nut (Figure 2, Item 1).

3. Remove circuit breaker (Figure 2, Item 2).

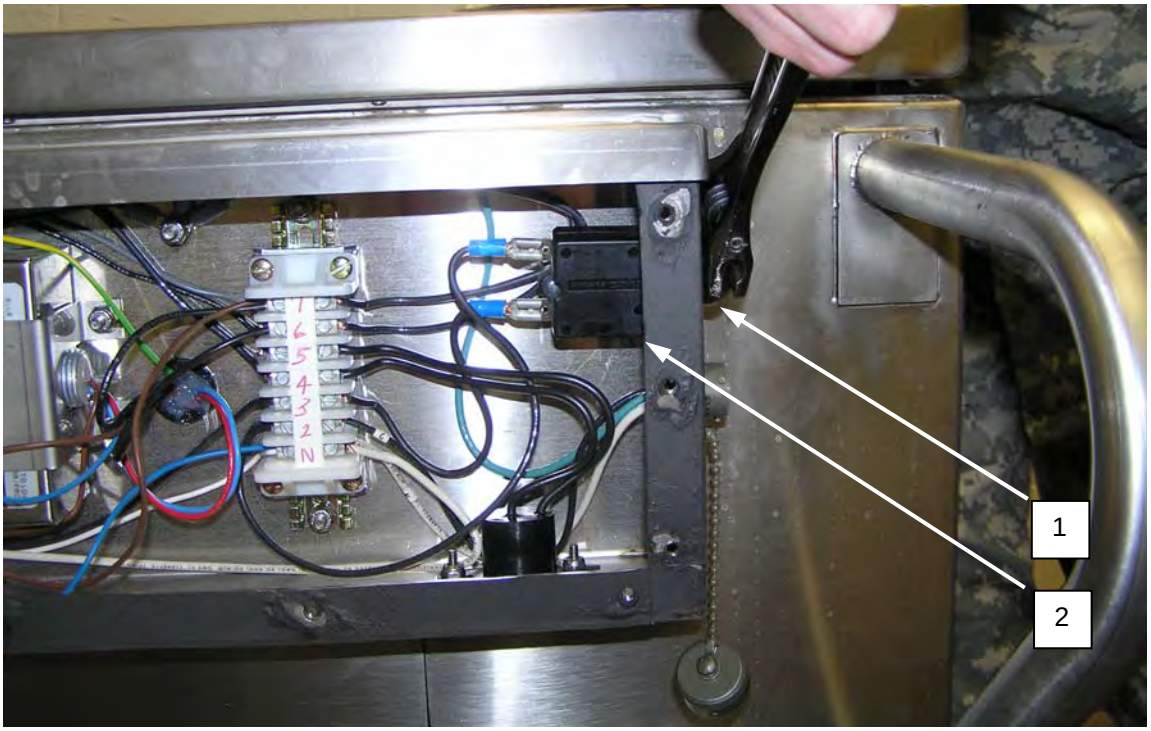


Figure 2. Circuit Breaker Removal.

4. One at a time, remove spade connectors (Figure 3, Item 1) from defective circuit breaker (Figure 3, Item 2) and install on replacement circuit breaker.

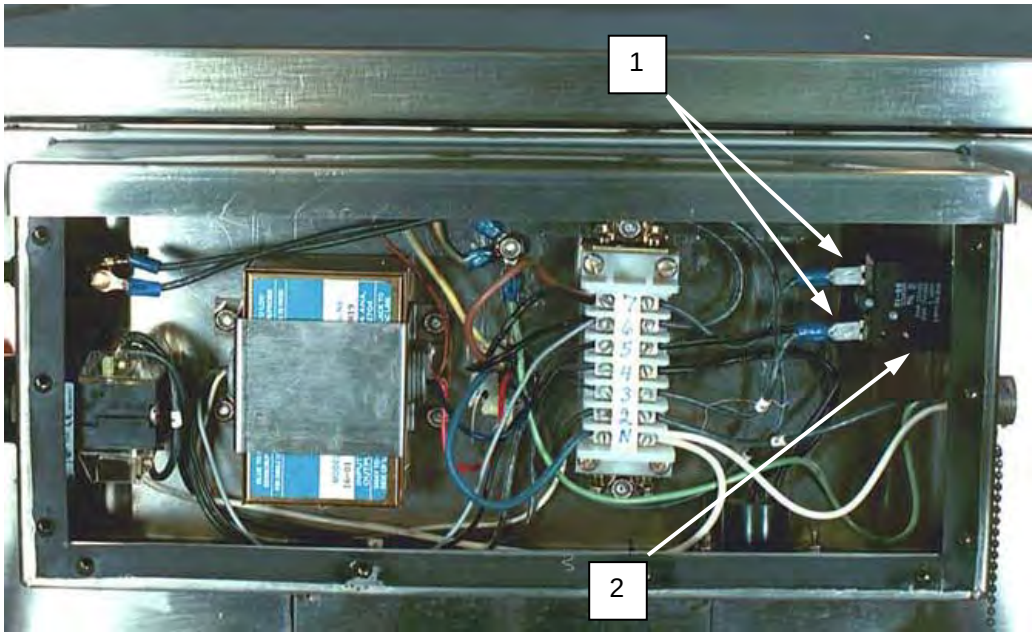


Figure 3. Removing Circuit Breaker Reset Switch.

REPLACE – CONTINUED

5. Install replacement circuit breaker (Figure 4, Item 1) and reinstall retaining nut (Figure 4, Item 2).

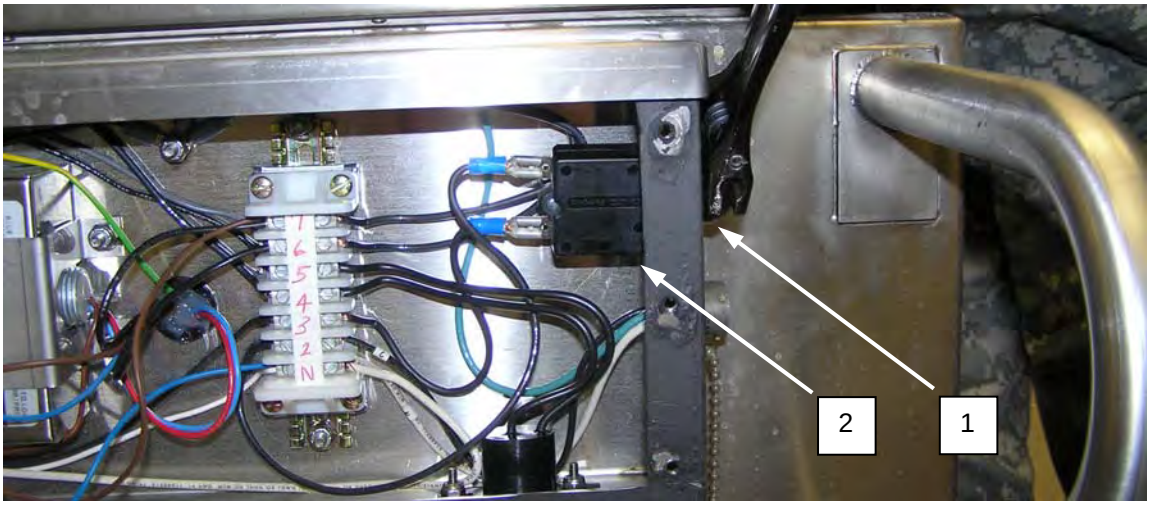


Figure 4. Circuit Breaker Removal.

NOTE

The desiccant bag is used to protect electrical components by absorbing moisture. If moisture is present in electrical control panel, the desiccant has become saturated and needs replacing. Replace with a new desiccant bag.

6. Ensure desiccant bag (Figure 5, Item 1) is in place inside control panel before replacing control panel cover (Figure 5, Item 2).

7. Install primary control panel access cover (Figure 5, Item 2), and retain with screws.

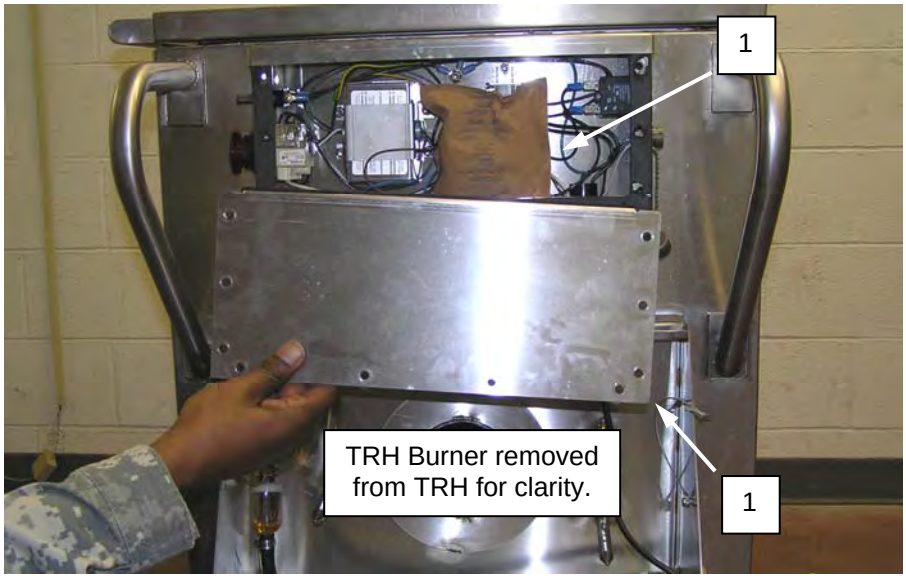


Figure 5. Access Cover Replacement.

END OF TASK

END OF WORK PACKAGE

SERVICE MAINTENANCE

CONNECTOR, ELECTRICAL
REPLACE

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit: Automotive (GMTK) (WP 0066, Item 4)

Personnel Required

Quartermaster Equipment Repairer 63J (1)
Food Service Technician 3381 (1)

Materials/Parts

Activated Desiccant (WP 0065, Item 5)

Equipment Condition

Power disconnected from TRH

REPLACE

1. Remove primary TRH electrical control panel cover (Figure 1, Item 1) by removing 10 screws. Retain screws. Remove desiccant bag (Figure 1, Item 2).

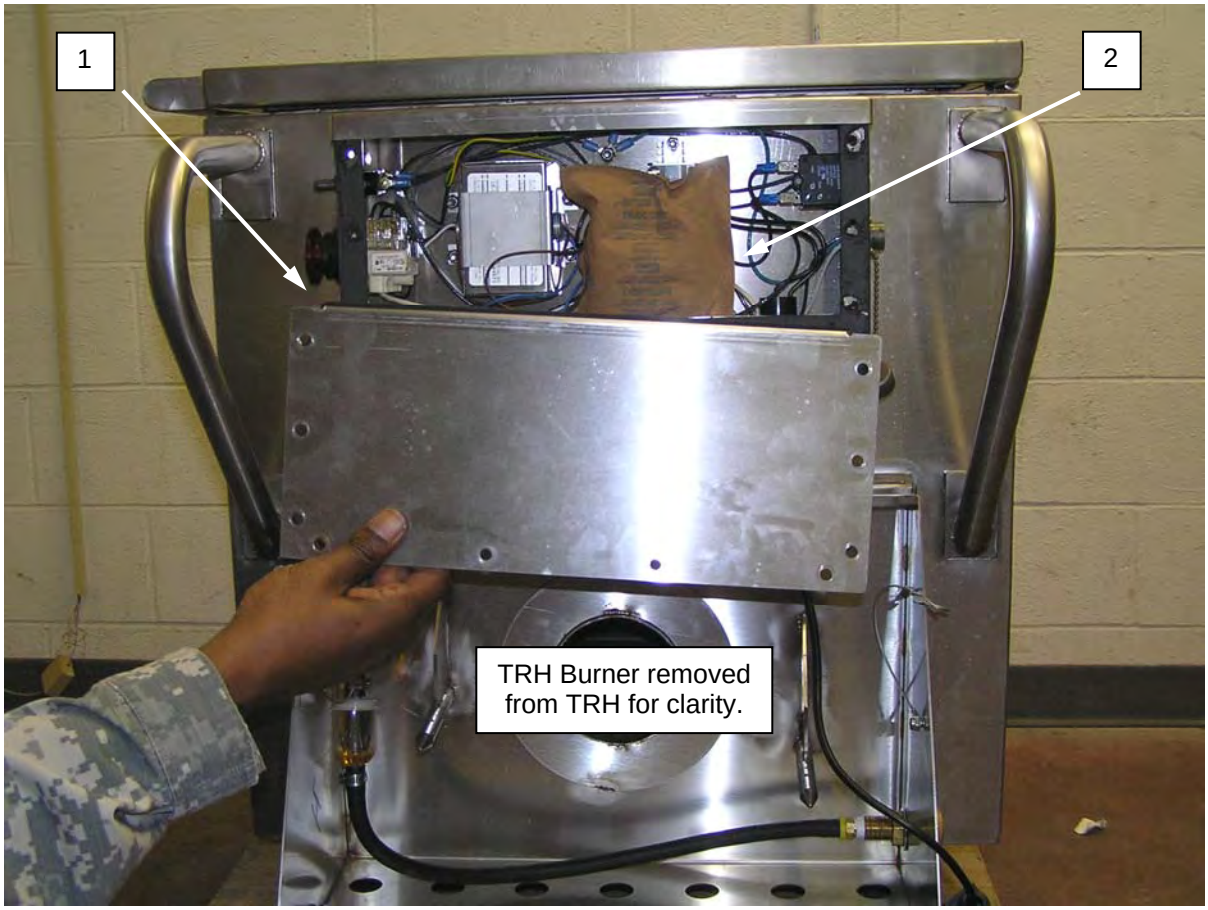


Figure 1. Access Cover Removal.

REPLACE – CONTINUED

NOTE

The main power fitting used by the Army is different from the power fitting used by the Marine Corps. When replacing the main power fitting, be sure that the correct fitting is being used as a replacement part. If the wrong fitting is used it will not connect to the power line.

2. Remove four Electrical Receptacle Connector retaining screws (Figure 2, Item 1). Retain screws and dust cap for re-use.

Figure 2. Main Power Fitting Removal.

3. Trace wires (Figure 3, Item 1) from the defective plug (Figure 3, Item 2), and replace them one at a time. Transfer wires from defective plug to new plug.

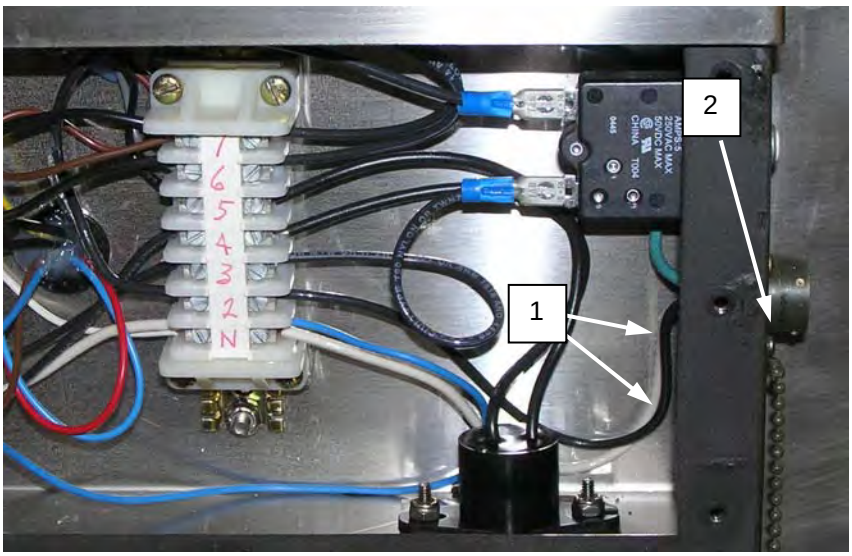


Figure 3. Main Power Fitting Wiring.

REPLACE - CONTINUED

4. Remove the ground wire (Figure 4, Item 1) from the ground connection (Figure 4, Item 2) inside the control panel and replace with the ground wire from the replacement Electrical Receptacle Connector.

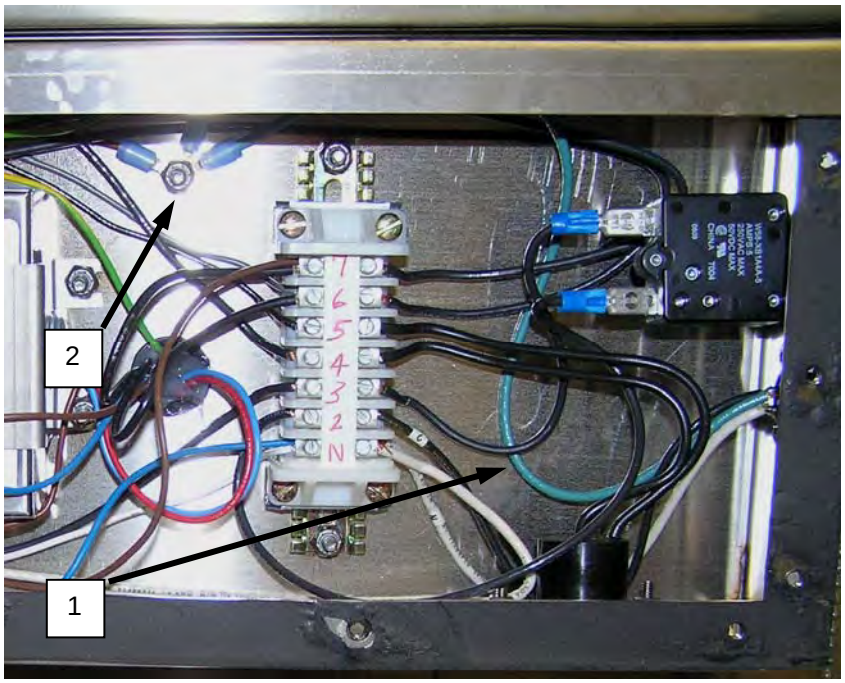


Figure 4. Ground Wire Connection.

5. Install the Electrical Receptacle Connector and four retaining screws with dust cap (Figure 5, Item 1).

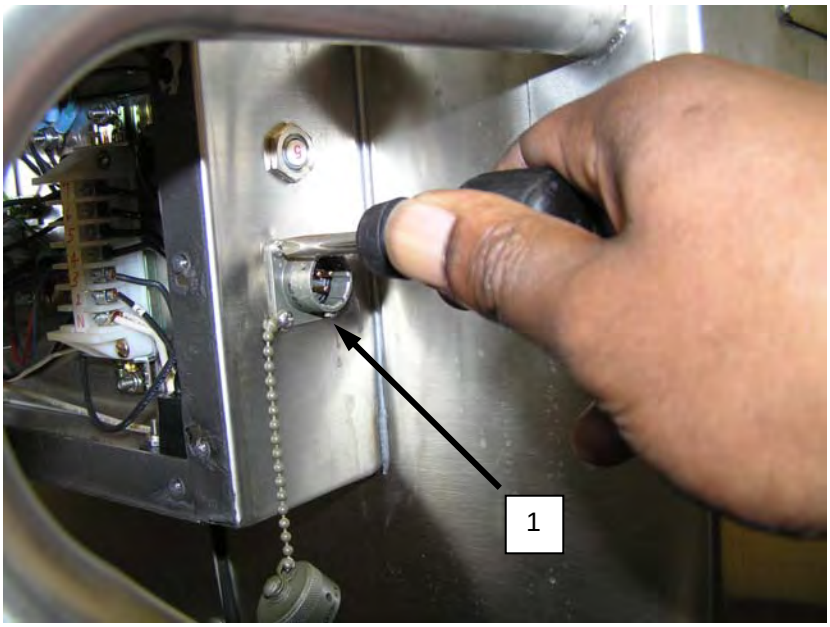


Figure 5. Main Power Fitting Replacement.

REPLACE - CONTINUED

NOTE

The desiccant bag is used to protect electrical components by absorbing moisture. If moisture is present in electrical control panel, the desiccant has become saturated and needs replacing. Replace with a new desiccant bag.

6. Ensure desiccant bag (Figure 6, Item 1) is in place inside control panel before replacing control panel cover.

7. Install primary control panel access cover (Figure 6, Item 2), and retain with screws.

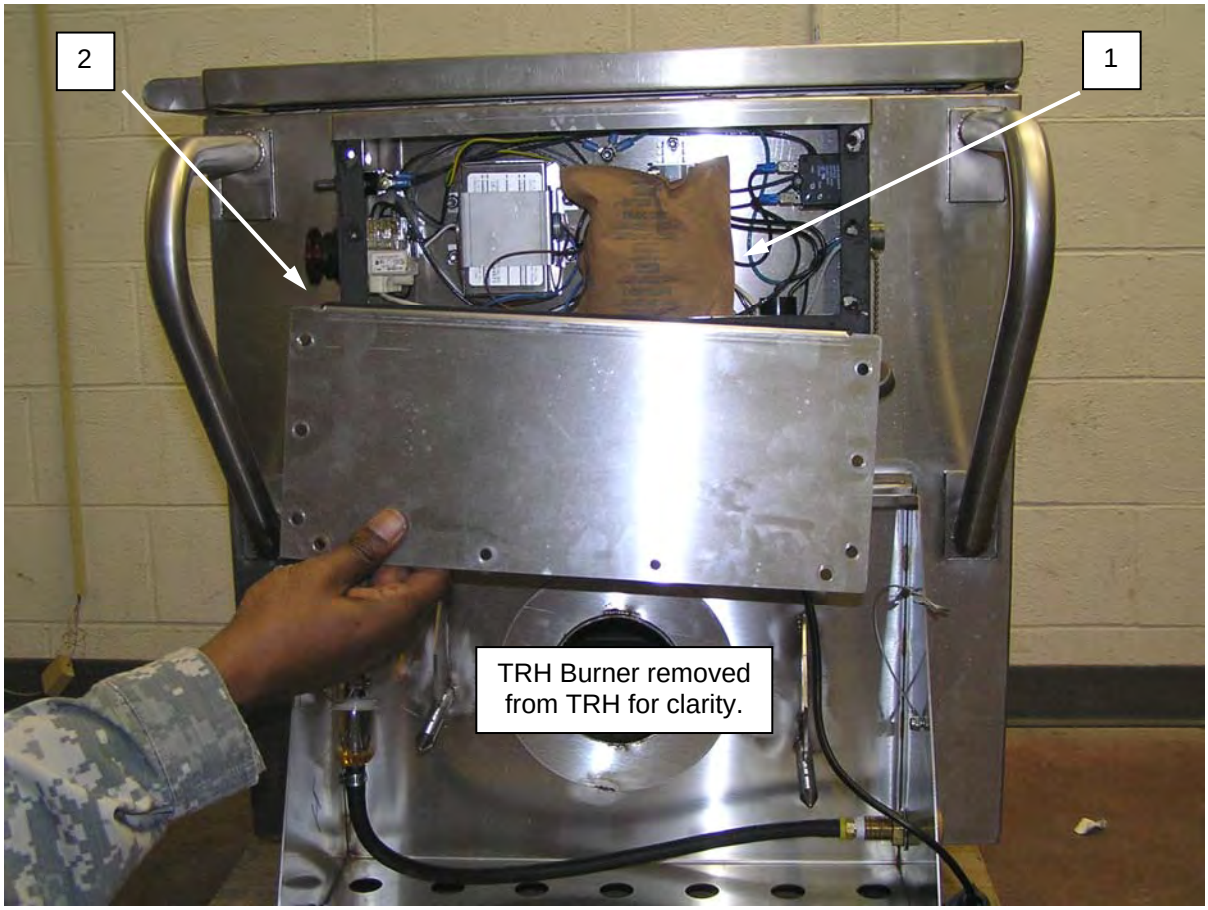


Figure 6. Access Cover Replacement.

END OF TASK

END OF WORK PACKAGE

SERVICE MAINTENANCE

TERMINAL JUNCTION BLOCK
REPLACE

INITIAL SETUP:

Tools and Special Tools	**Personnel Required**
General Mechanic's Tool Kit: Automotive (GMTK) (WP 0066, Item 4)	Quartermaster Equipment Repairer 63J (1) Food Service Technician 3381 (1)
Materials/Parts	**Equipment Condition**
Activated Desiccant (WP 0065, Item 5)	Power disconnected from TRH

REPLACE

1. Remove primary TRH electrical control panel cover (Figure 1, Item 1) by removing 10 screws. Retain screws. Remove desiccant bag (Figure 1, Item 2).

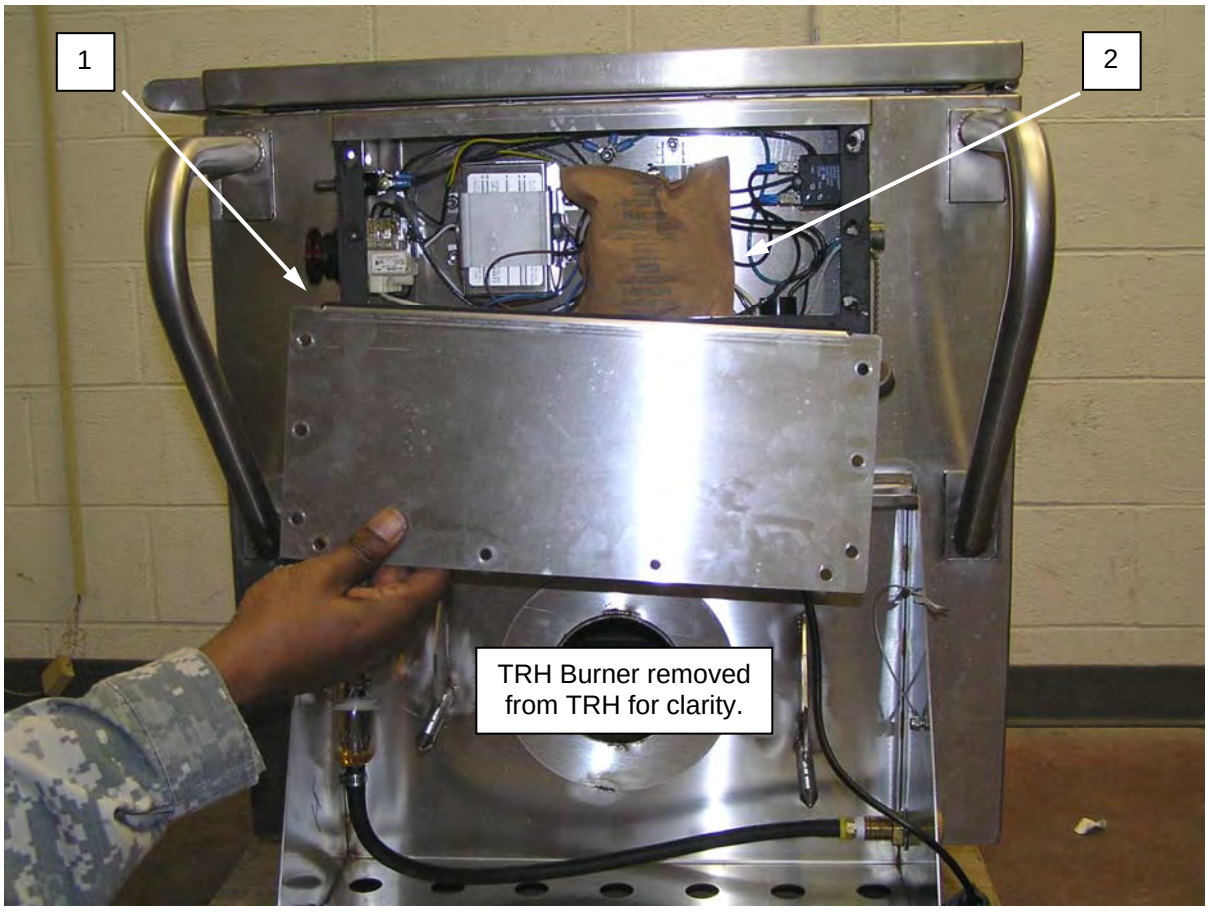


Figure 1. Access Cover Removal.

REPLACE - CONTINUED

2. Remove two nuts (Figure 2, Item 1) retaining terminal block to tank control panel (Figure 2, Item 1).

3. Leaving wires attached, move old terminal block so that the replacement terminal block can be installed.

4. Attach replacement terminal block to tank control panel using two retaining nuts (Figure 2, Item 1).

5. One at a time, remove all wires from old terminal block and attach to replacement terminal block with retaining screws (Figure 2, Item 2).

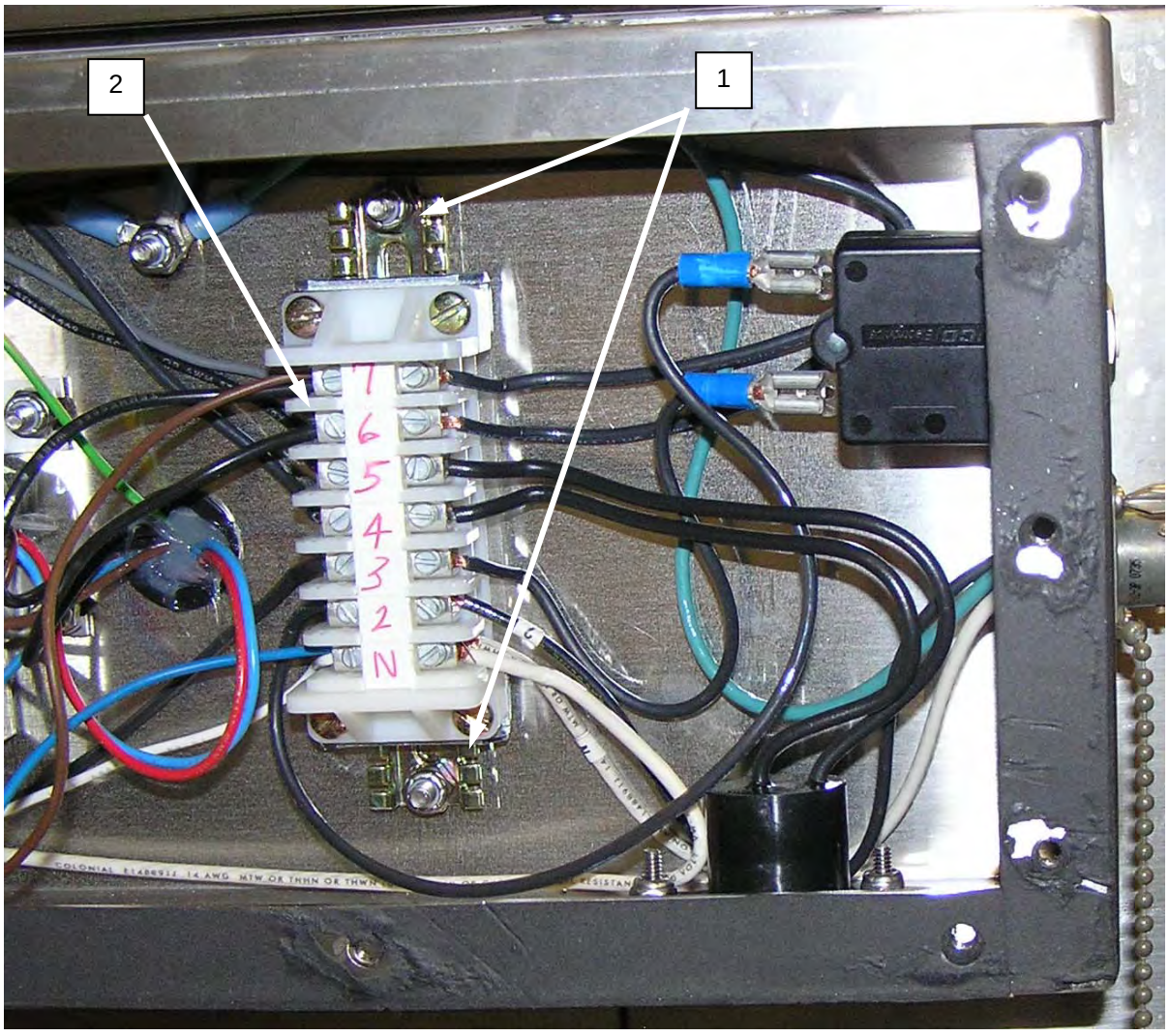


Figure 2. TRH Tank Terminal Block.

REPLACE – CONTINUED

NOTE

The desiccant bag is used to protect electrical components by absorbing moisture. If moisture is present in electrical control panel, the desiccant has become saturated and needs replacing. Replace with a new desiccant bag.

6. Ensure desiccant bag (Figure 3, Item 1) is in place inside control panel before replacing control panel cover (Figure 3, Item 2).

7. Install primary control panel access cover (Figure 3, Item 2), and retain with screws.

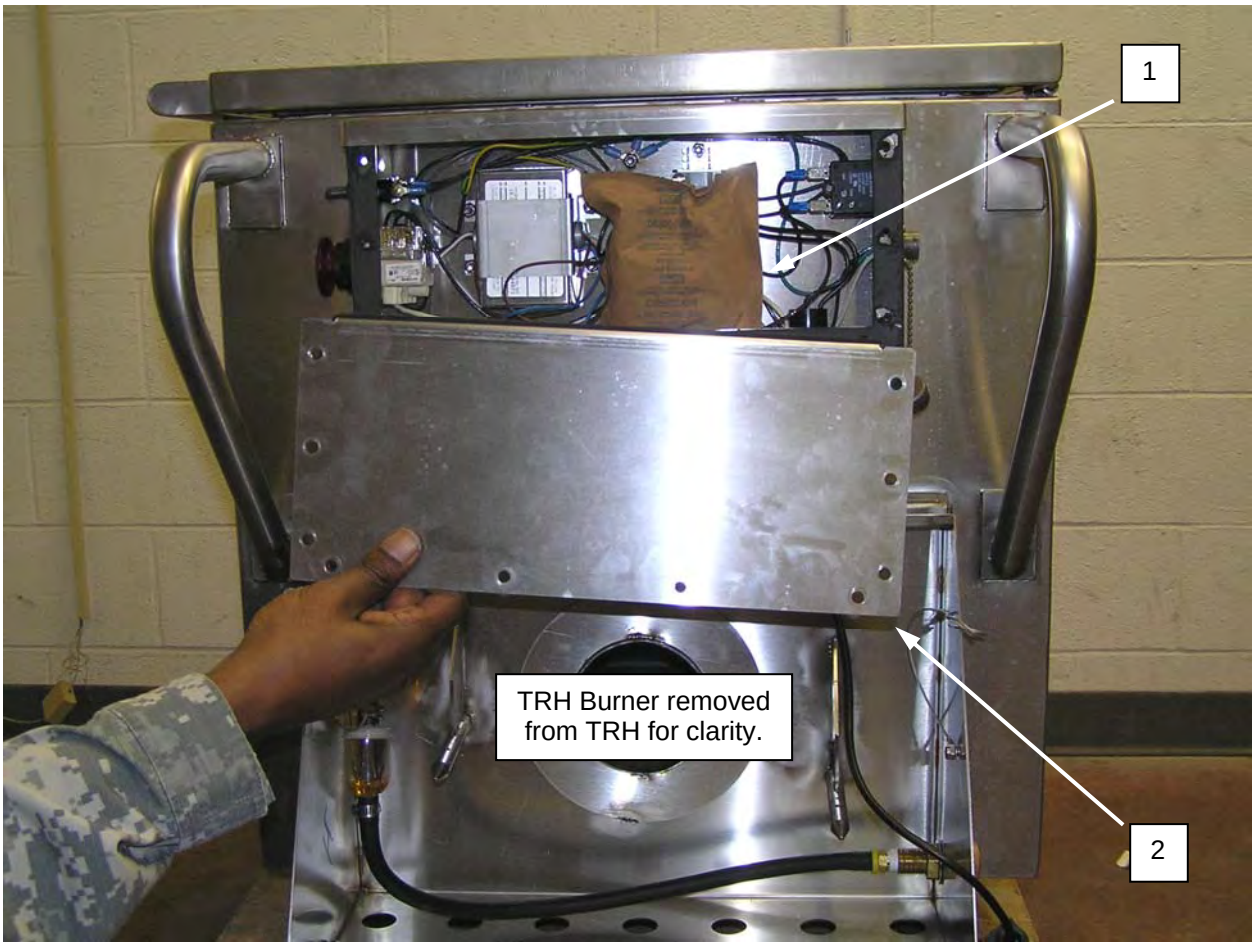


Figure 3. Access Cover Replacement.

END OF TASK

END OF WORK PACKAGE

SERVICE MAINTENANCE

LIQUID LEVEL SWITCH
REPLACE

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit: Automotive (GMTK) (WP 0066, Item 4)

Personnel Required

Quartermaster Equipment Repairer 63J (1)
Food Service Technician 3381 (1)

Materials/Parts

Splice Conductor (WP 0065, Item 4)
Activated Desiccant (WP 0065, Item 5)
RTV Sealant (WP 0065, Item 16)
Electrical Insulation Tape (WP 0065, Item 18)

Equipment Condition

Power disconnected from TRH

REPLACE

1. Remove primary TRH electrical control panel cover (Figure 1, Item 1) by removing 10 screws. Retain screws. Remove desiccant bag (Figure 1, Item 2).

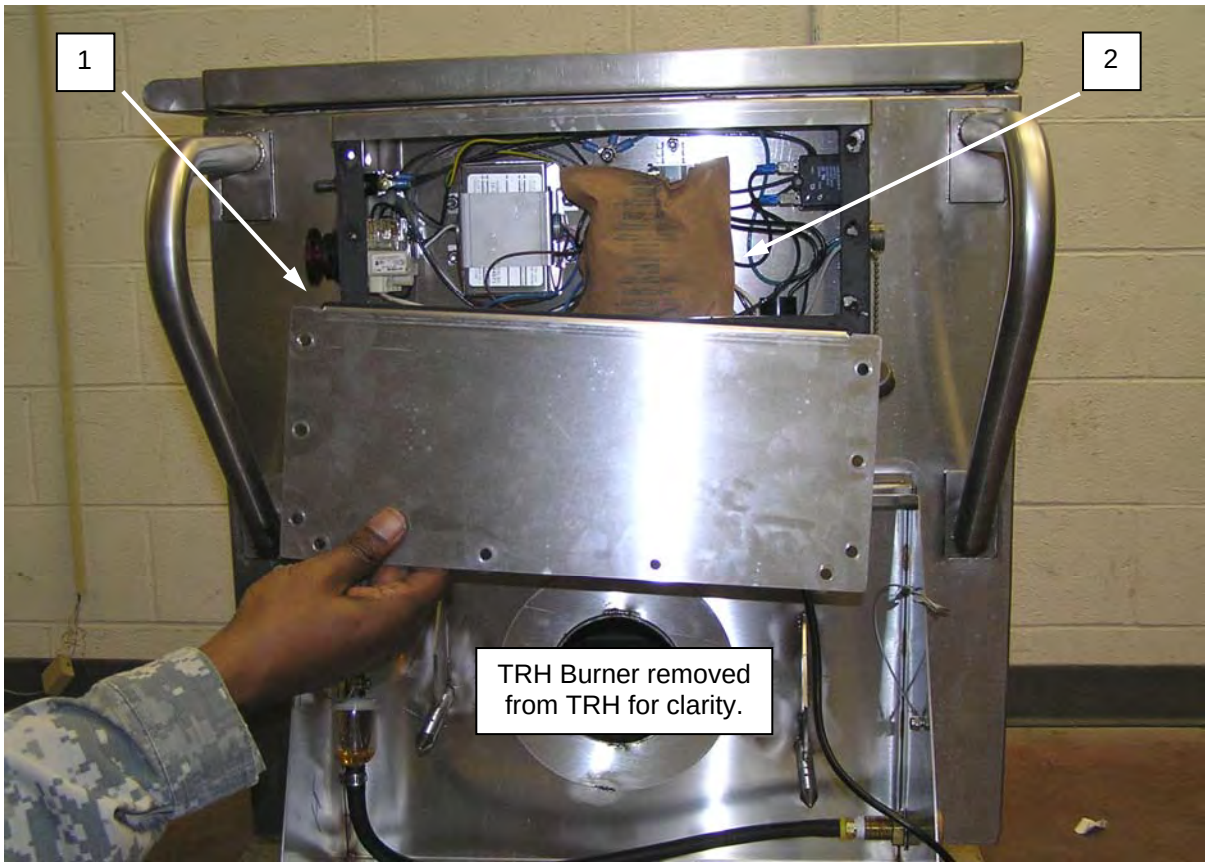


Figure 1. Access Cover Removal.

REPLACE – CONTINUED

2. Remove four mounting nuts from liquid level switch mounting bracket (Figure 2, Item 1).

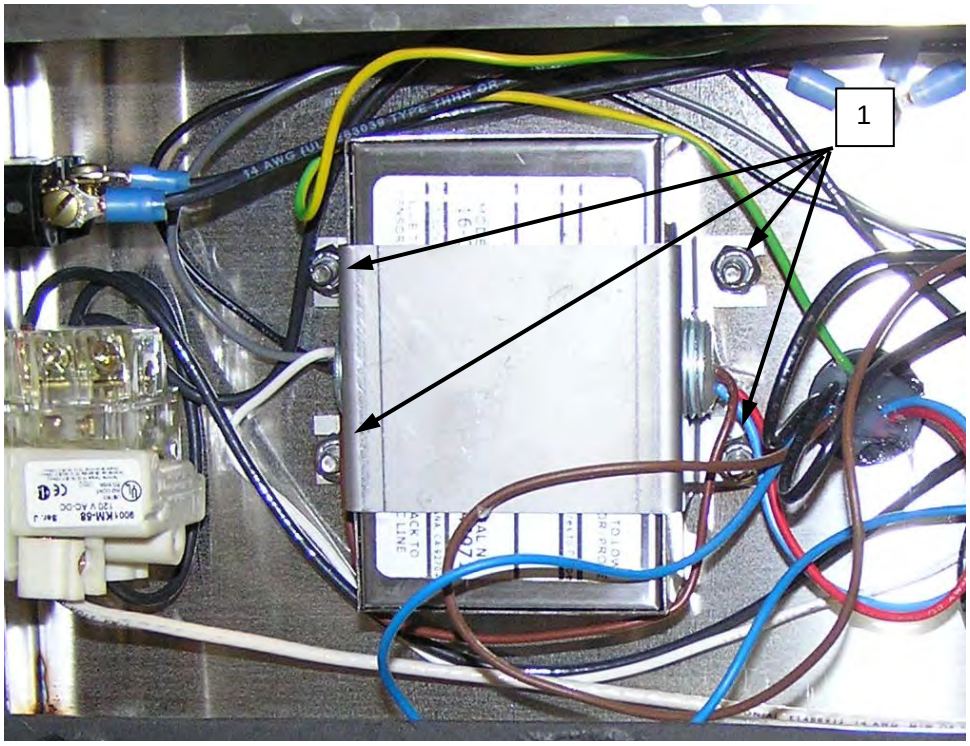


Figure 2. Removing Liquid Level Switch Mounting Bracket.

3. Cut wires (Figure 3, Item 1).

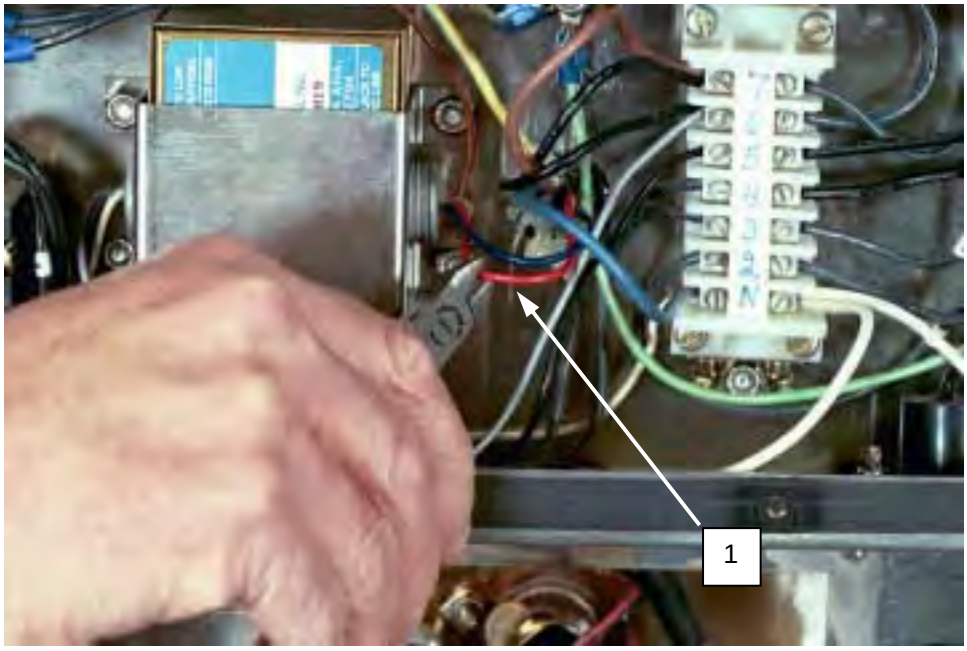


Figure 3. Cutting Liquid Level Switch Wires.

REPLACE – CONTINUED

4. Use butt connectors to splice wires (Figure 4, Item 1) from replacement liquid level switch (Figure 4, Item 2) to those cut away from old unit.

5. Install replacement liquid level switch using mounting bracket and nuts (Figure 4, Item 3). Do not over tighten.

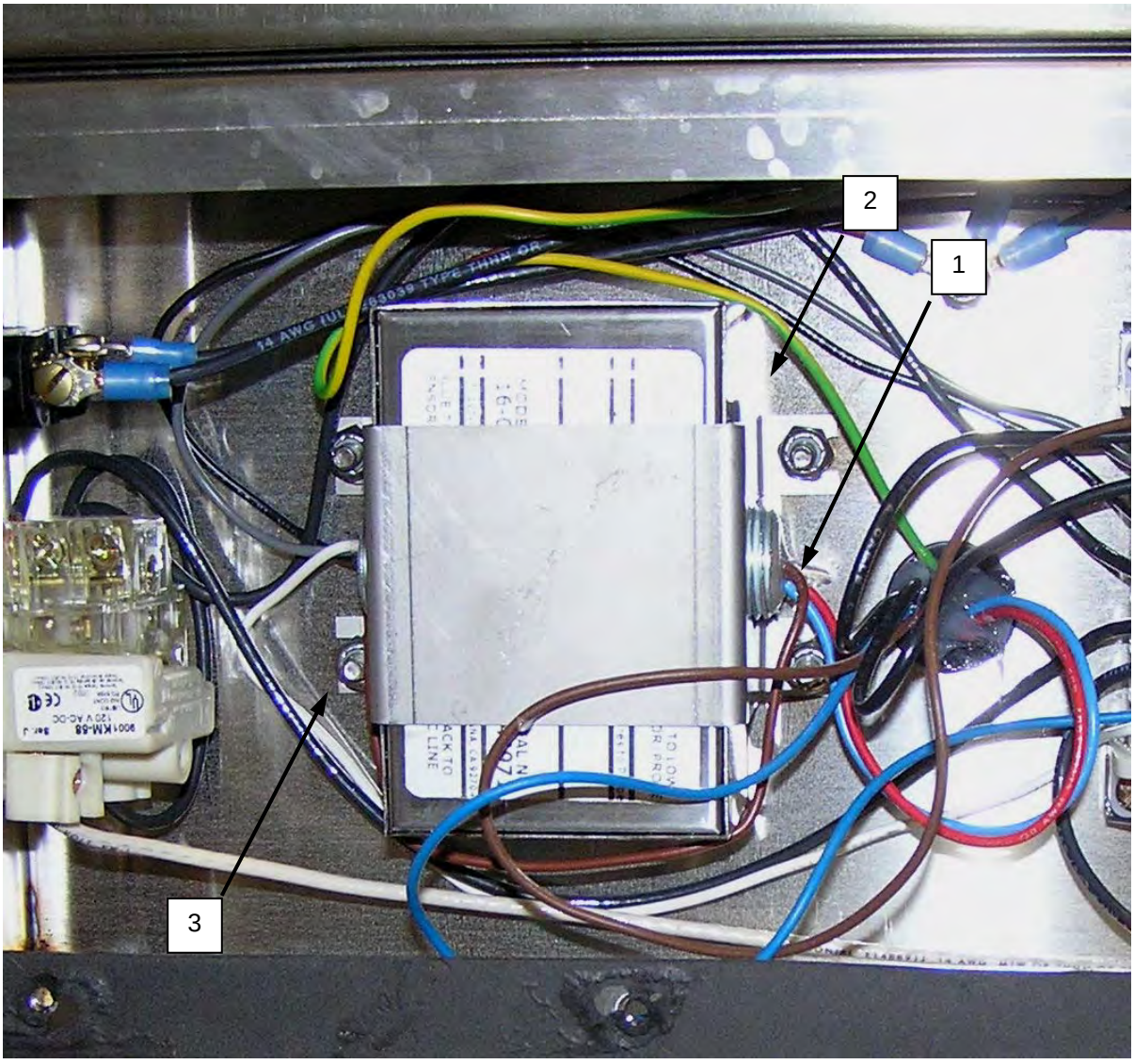


Figure 4. Installing Liquid Level Switch and Wires.

REPLACE – CONTINUED

NOTE

The desiccant bag is used to protect electrical components by absorbing moisture. If moisture is present in electrical control panel, the desiccant has become saturated and needs replacing. Replace with a new desiccant bag.

6. Ensure desiccant bag (Figure 5, Item 1) is in place inside control panel before replacing control panel cover (Figure 3, Item 2).

7. Install primary control panel access cover (Figure 5, Item 2), and retain with screws.

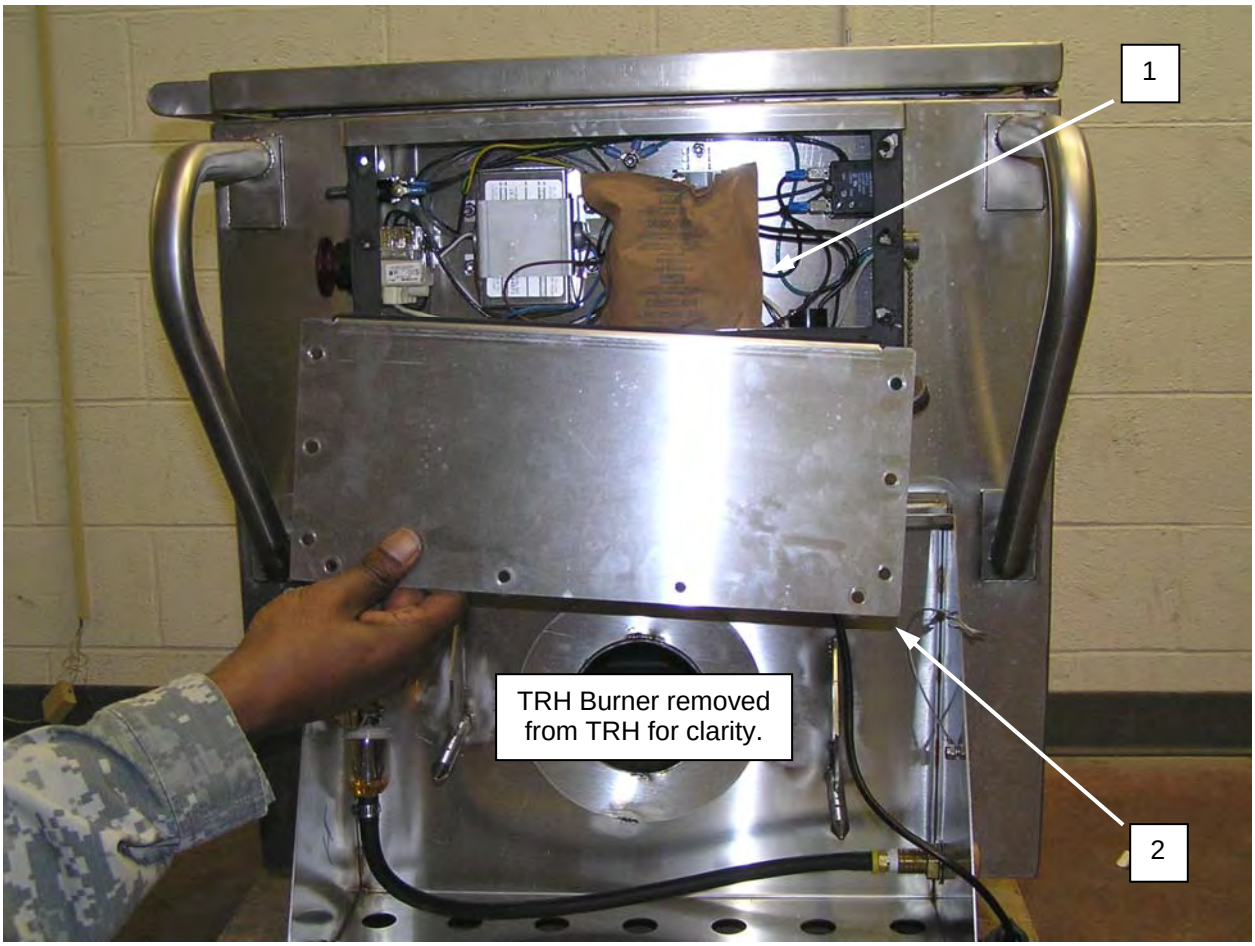


Figure 5. Access Cover Replacement.

END OF TASK

END OF WORK PACKAGE

SERVICE MAINTENANCE

MARTRON PROBE SENSOR REPLACE

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit: Automotive (GMTK) (WP 0066, Item 4)

Personnel Required

Quartermaster Equipment Repairer 63J (1)
Food Service Technician 3381 (1)

Materials/Parts

RTV Sealant (WP 0065, Item 16)

Equipment Condition

TRH drained of water
Power disconnected from TRH

REPAIR

1. Remove secondary TRH electrical control panel cover (Figure 1, Item 1) and black rubber cover gasket by removing four screws. Retain screws.

Figure 1. Secondary Access Panel Cover.

REPAIR – CONTINUED

2. Remove the blanket insulation from inside the access cover and set aside.

3. Remove the sealant protecting the martron probe (Figure 2, Item 1) and discard sealant.

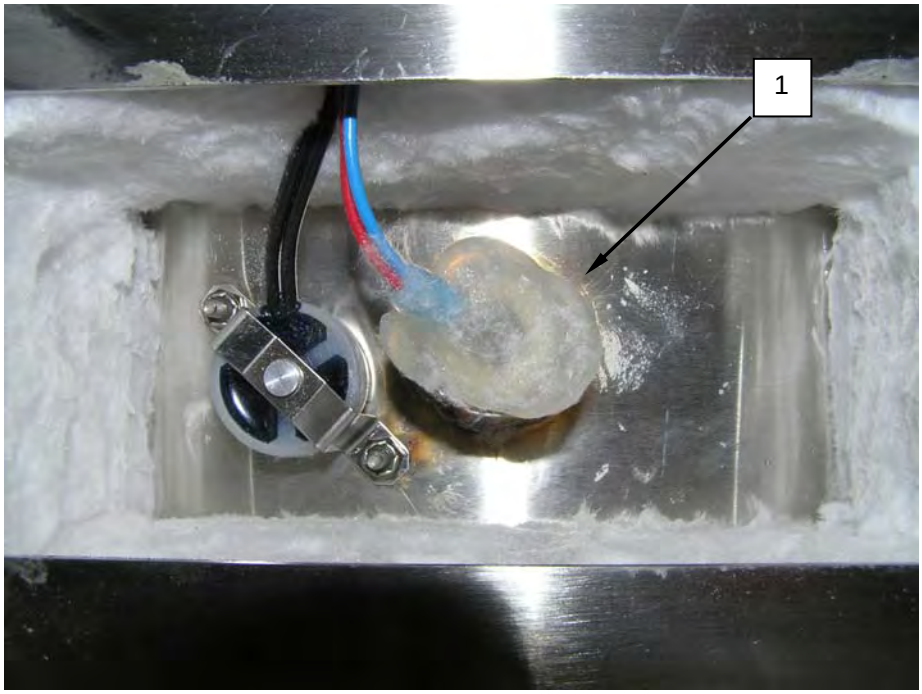


Figure 2. Martron Probe Location.

4. Remove the stainless steel screw from the wire lead on the probe (Figure 3, Item 1).

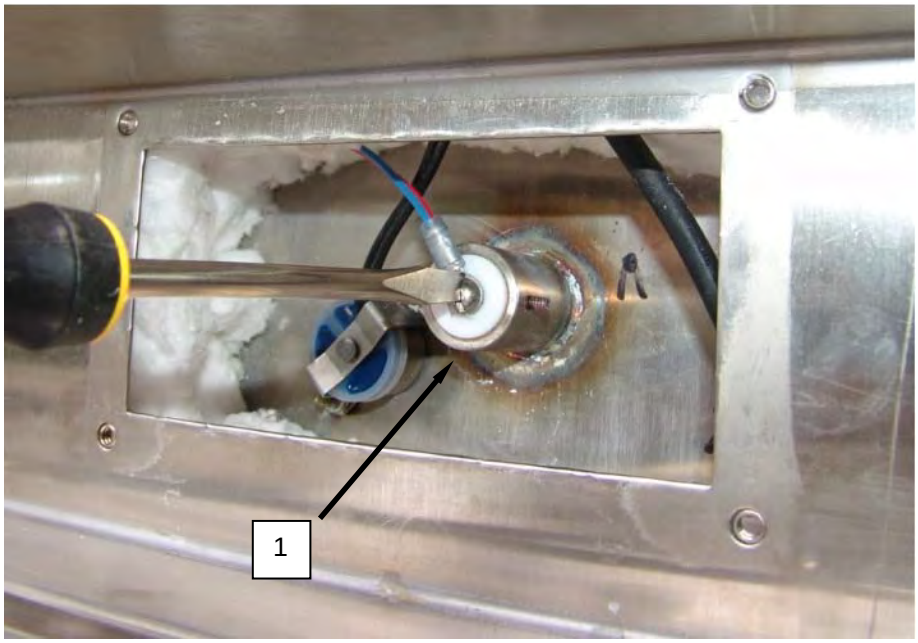


Figure 3. Martron Probe and Setscrew Removal.

REPAIR – CONTINUED

5. The martron probe is secured inside the stainless sleeve via an O-ring seal and a stainless setscrew. Loosen the setscrew to allow removal of the martron probe (Figure 4, Item 1).

6. Using the blunt end of a screwdriver, push the martron probe out of its stainless steel sleeve by pushing from inside the tank outward toward the secondary access panel (Figure 4, Item 2).

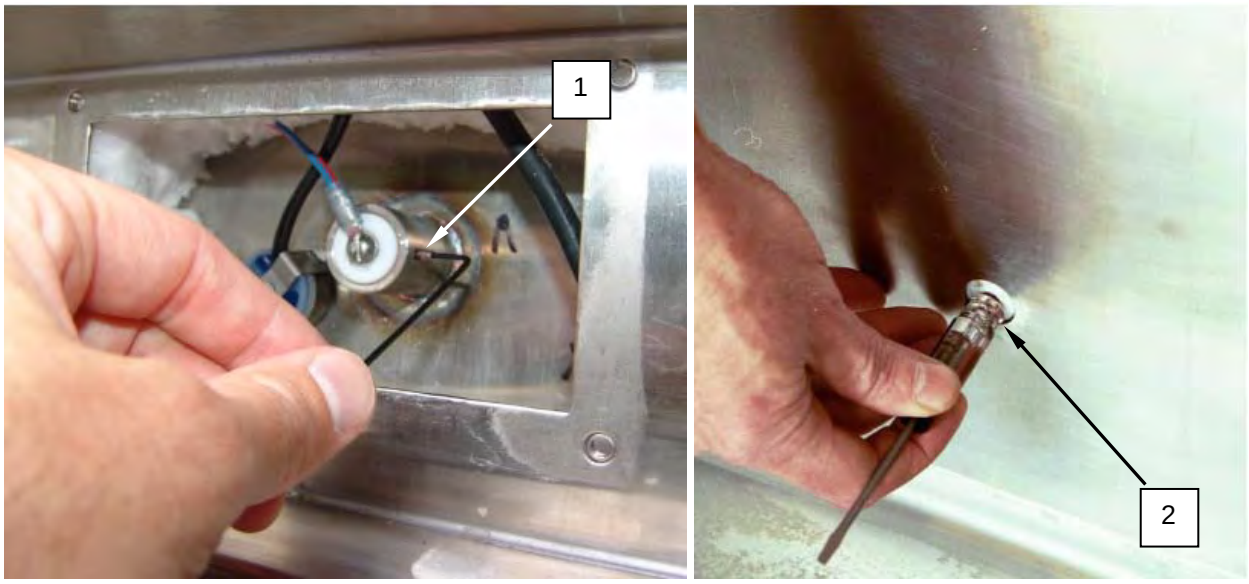


Figure 4. Removing the Martron Probe.

7. Insert the replacement martron probe assembly into the stainless sleeve. Ensure setscrew (Figure 5, Item 1) is backed out of martron probe and ensure O-ring seal is present on martron probe (Figure 5, Item 2).

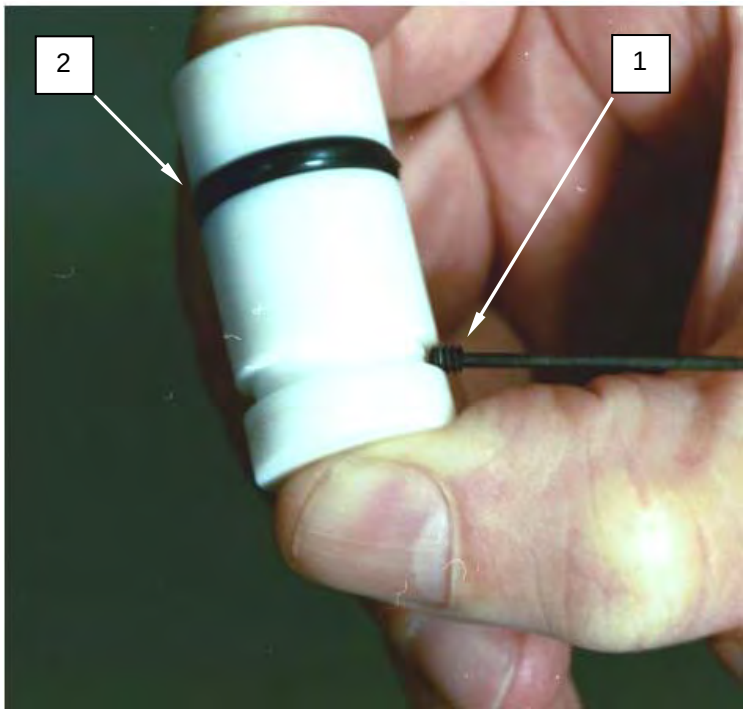


Figure 5. Martron Probe.

REPAIR – CONTINUED

8. Tighten setscrew in place (Figure 6, Item 1).

9. Reconnect and tighten the eye loop connector lead back onto the martron probe (Figure 6, Item 2).

10. Apply RTV sealant to top of screw head and connector for insulation.

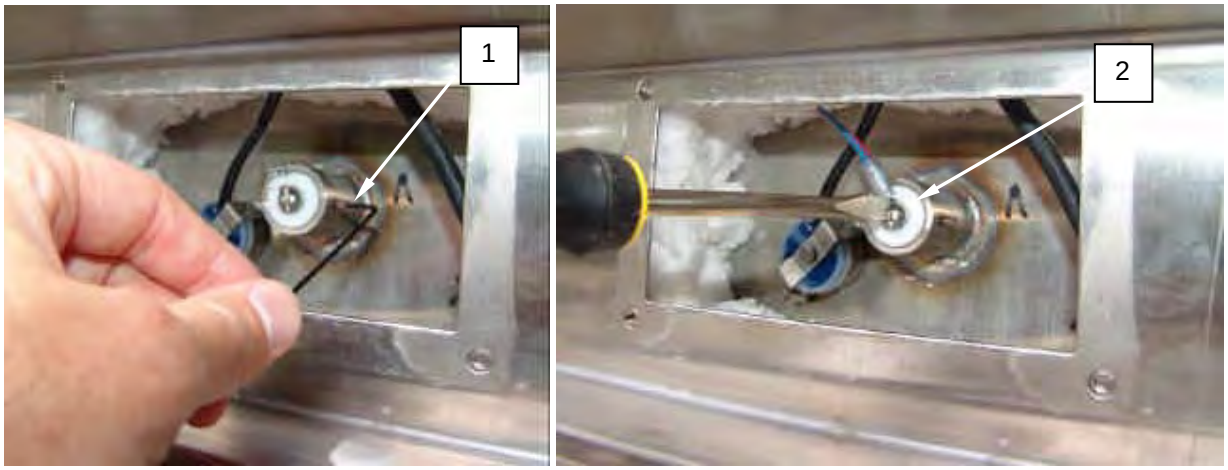


Figure 6. Installing Martron Probe.

11. Install blanket insulation in secondary access panel.

12. Install the secondary access cover (Figure 7, Item 1), ensuring that the black rubber cover plate gasket is between the stainless steel cover plate and the tray ration heater tank.

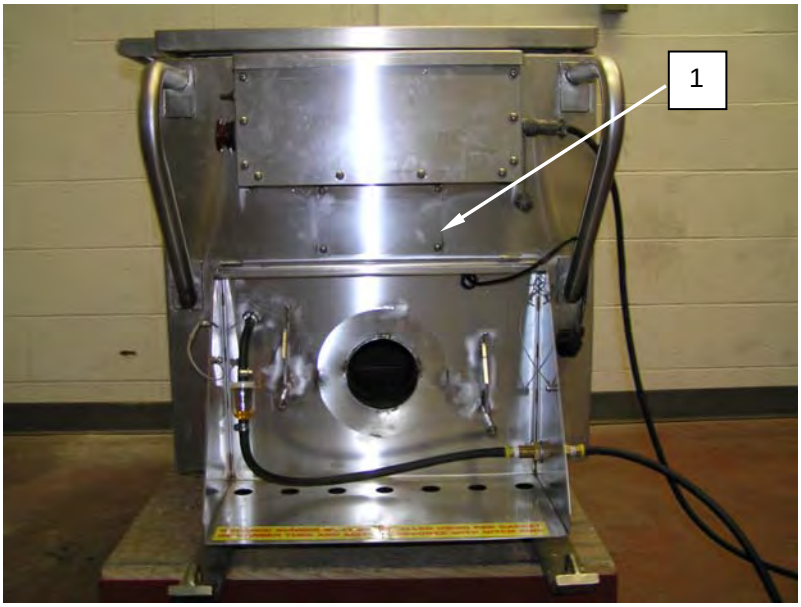


Figure 7. Secondary Access Panel Cover.

END OF TASK

END OF WORK PACKAGE

SERVICE MAINTENANCE

MERCURY TILT SWITCH REPLACE

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit: Automotive (GMTK) (WP 0066, Item 4)

Personnel Required

Quartermaster Equipment Repairer 63J (1)
Food Service Technician 3381 (1)

Materials/Parts

Activated Desiccant (WP 0065, Item 5)

Equipment Condition

Power disconnected from TRH

REPLACE

WARNING

Before replacing the mercury tilt switch, check your unit SOP and local environmental regulations to ensure the switch will be disposed of properly. Do not open, incinerate, or bury the switch. Failure to observe safety precautions may result in environmental contamination and possible poisoning of personnel.

1. Remove primary TRH electrical control panel cover (Figure 1, Item 1) by removing 10 screws. Retain screws. Remove desiccant bag (Figure 1, Item 2).

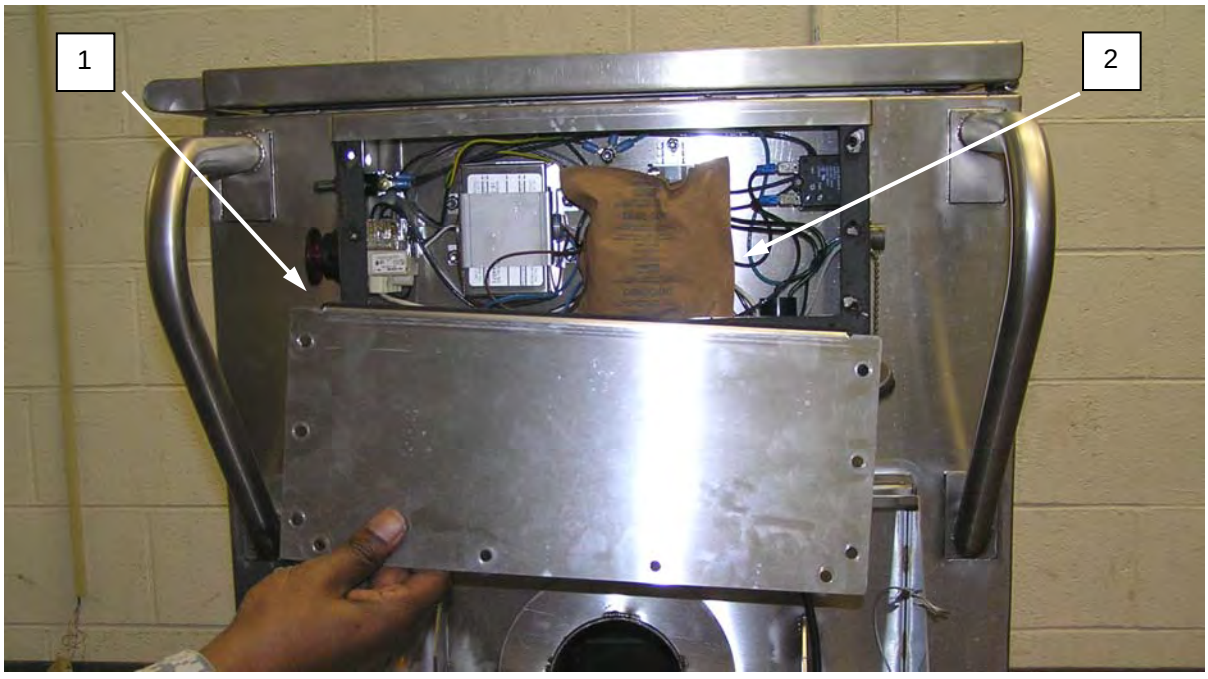


Figure 1. Access Cover Removal.

REPLACE – CONTINUED

2. Remove two tilt switch retaining nuts from angled platform (Figure 2, Item 1).

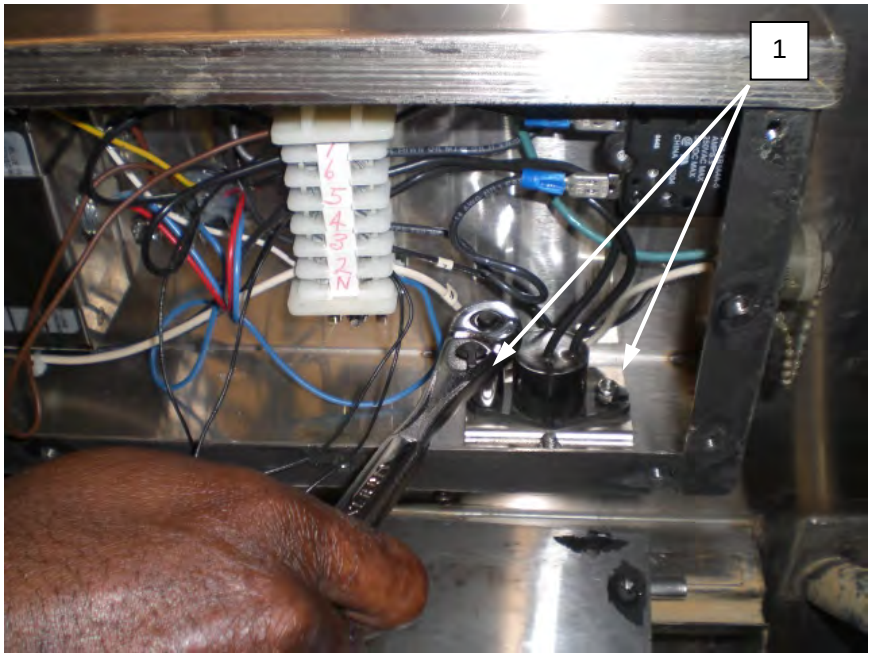


Figure 2. Tank Tilt Switch Removal.

3. Install replacement tilt switch by removing and replacing one wire at a time (Figure 3, Item 1) on the terminal block (Figure 3, Item 2).

4. Install switch in control box and tighten screws.

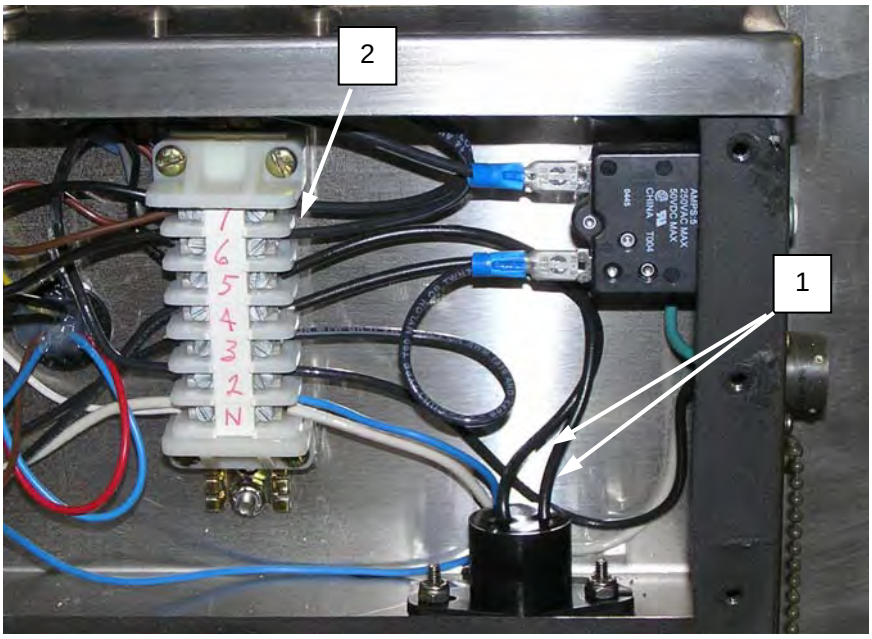


Figure 3. Mercury Tilt Switch Wiring.

REPLACE – CONTINUED

NOTE

The desiccant bag is used to protect electrical components by absorbing moisture. If moisture is present in electrical control panel, the desiccant has become saturated and needs replacing. Replace with a new desiccant bag.

5. Ensure desiccant bag (Figure 4, Item 1) is in place inside control panel before replacing control panel cover.

6. Install primary control panel access cover (Figure 4, Item 2), and retain with screws.

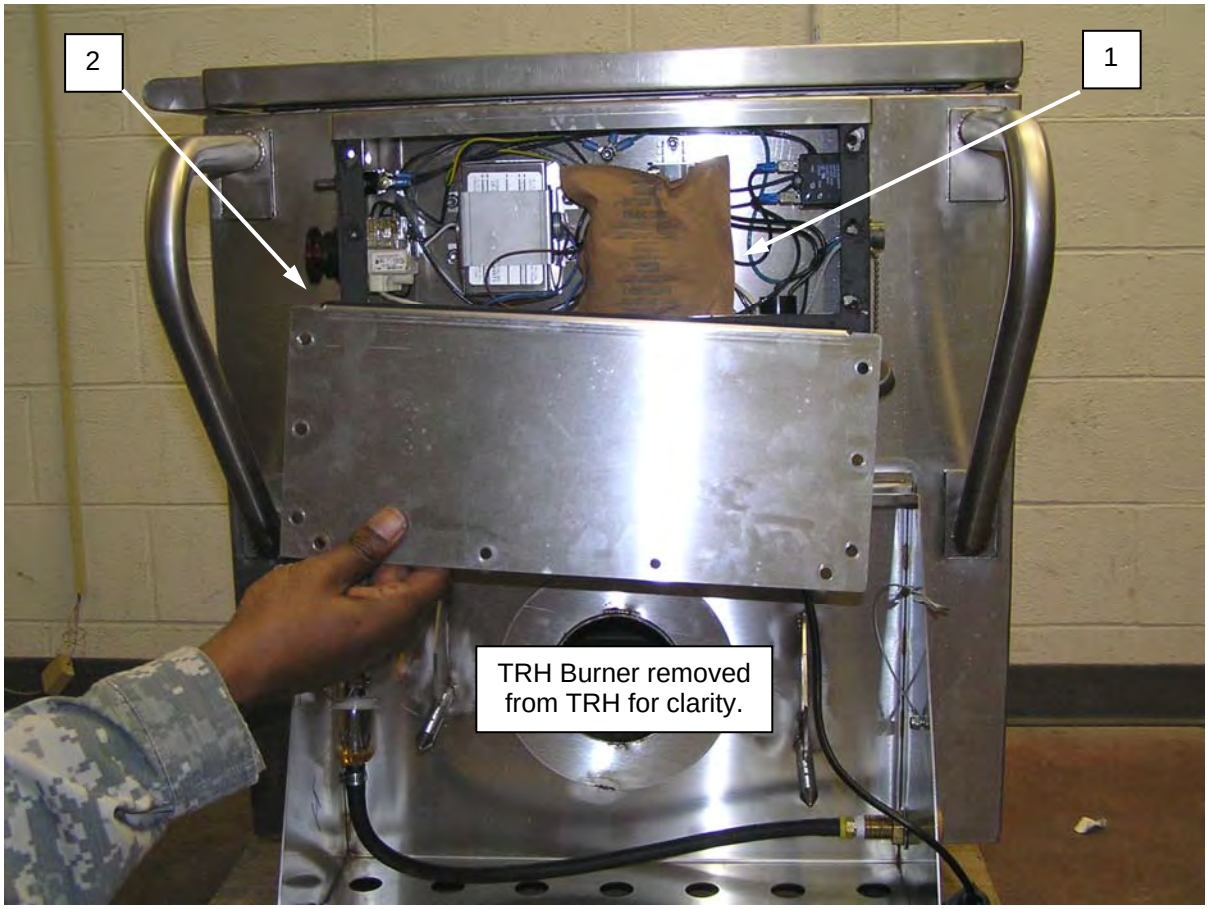


Figure 4. Access Cover Replacement.

END OF TASK

END OF WORK PACKAGE

SERVICE MAINTENANCE

THERMAL RESISTOR
REPLACE

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit: Automotive (GMTK) (WP 0066, Item 4)

Personnel Required

Quartermaster Equipment Repairer 63J (1)
Food Service Technician 3381 (1)

Materials/Parts

Splice Conductor (WP 0065, Item 4)
Activated Desiccant (WP 0065, Item 5)
RTV Sealant (WP 0065, Item 16)
Electrical Insulation Tape (WP 0065, Item 18)

Equipment Condition

Power disconnected from TRH

REPLACE

1. Remove secondary TRH electrical control panel cover (Figure 1, Item 1) by removing four screws. Retain screws.

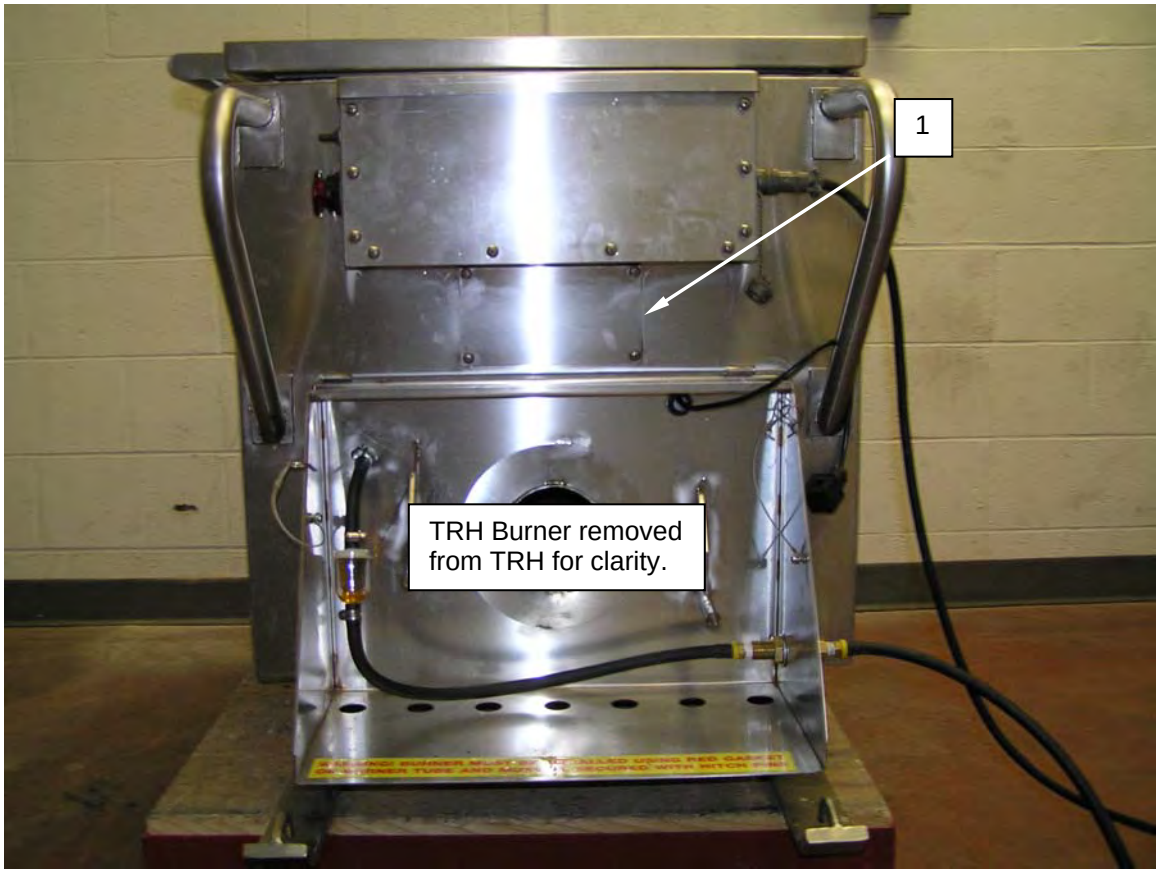


Figure 1. Secondary Access Panel Cover.

REPLACE - CONTINUED

2. Remove the blanket insulation from inside the access control panel and set aside.

3. Inside the secondary access panel, locate the thermal resistor (Figure 2, Item 1).

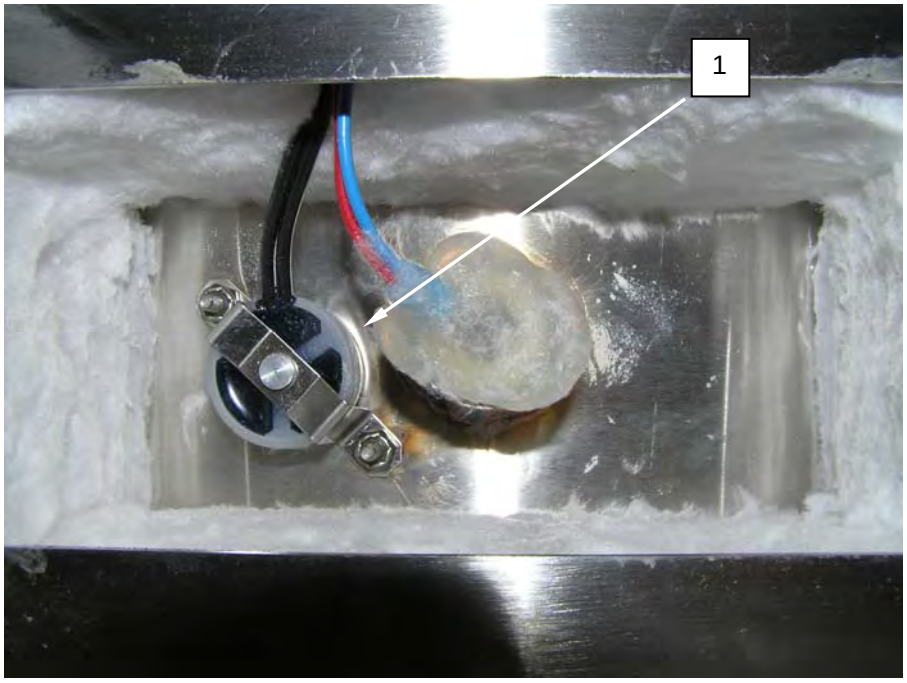


Figure 2. Thermal Resistor Location.

4. Remove the lock nuts (Figure 3, Item 1) from the threaded studs on the thermal resistor Mounting Bracket. Loosen thermal resistor mounting flange (Figure 3, Item 2) from threaded studs and remove it by hand.

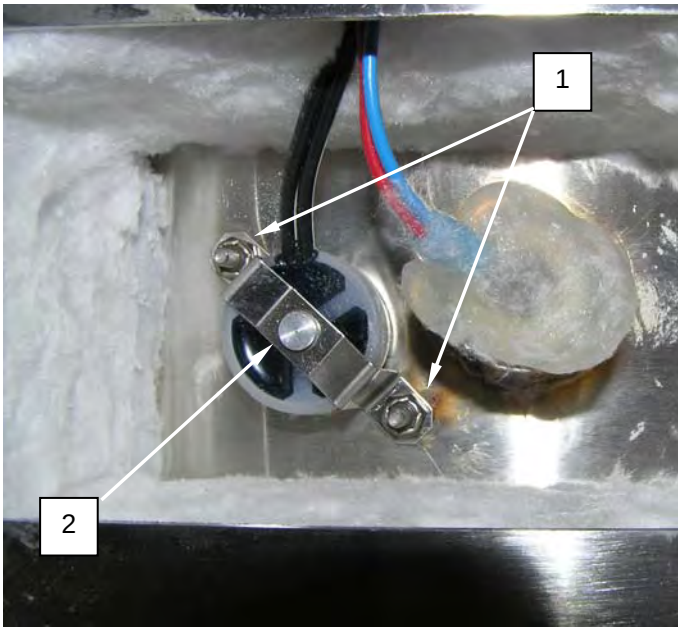


Figure 3. Removing the Thermal Resistor Retaining Nuts.

REPLACE – CONTINUED

5. Cut wire leads, approximately 2 inches in length, from thermal resistor. Discard bad thermal resistor and leave hanging wire leads for reconnection later (Figure 4, Item 1).

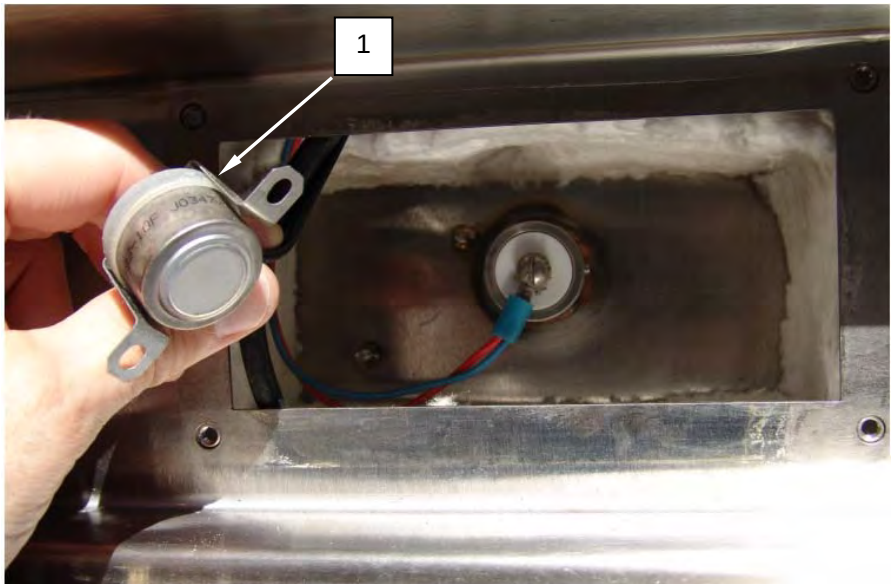


Figure 4. Removing the Thermal Resistor.

6. Mount a new thermal resistor so that it sits in the same position as the bad thermal resistor.

7. Align holes in the mounting flange over the threaded weld studs and push the thermal resistor into place so it is flush against the TRH tank wall. Secure thermal resistor into place with lock nuts (Figure 5, Item 1).

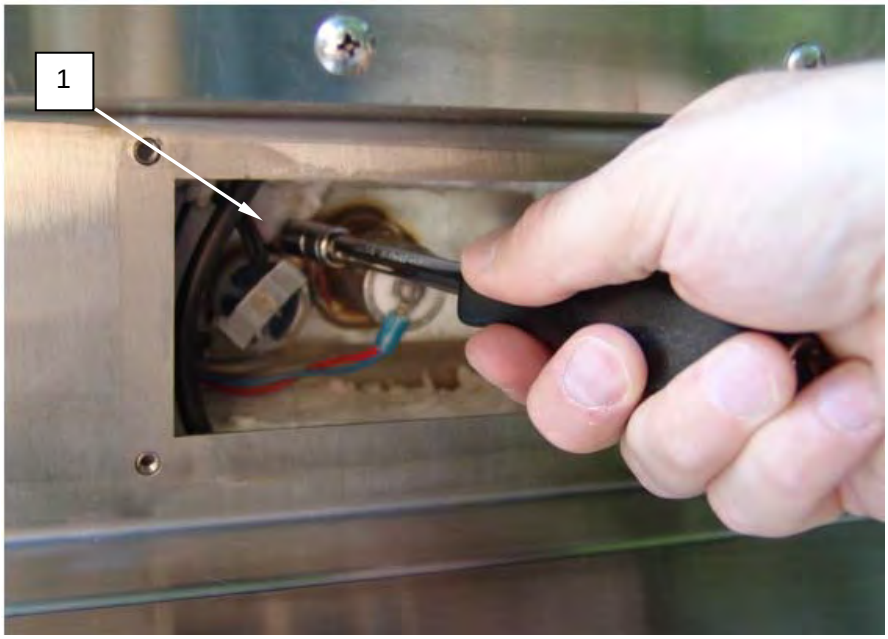


Figure 5. Removing the Thermal Resistor Retaining Nuts.

REPLACE – CONTINUED

8. Using butt connectors (Figure 6, Item 1), connect the thermal resistor wires back to the wire leads in the tank. Orientation of wires is not important.

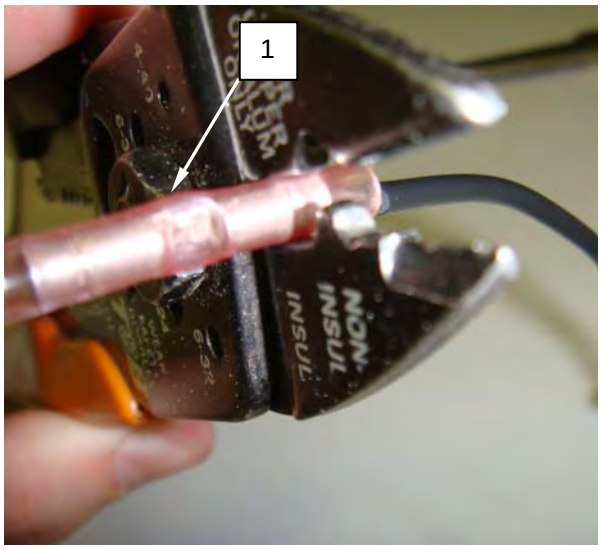


Figure 6. Wire Connections Using a Butt Connector.

9. Install blanket insulation in secondary access panel.

10. Install the secondary access cover (Figure 7, Item 1) ensuring that the black rubber cover plate gasket is between the stainless steel cover plate and the Tray Ration Heater tank.

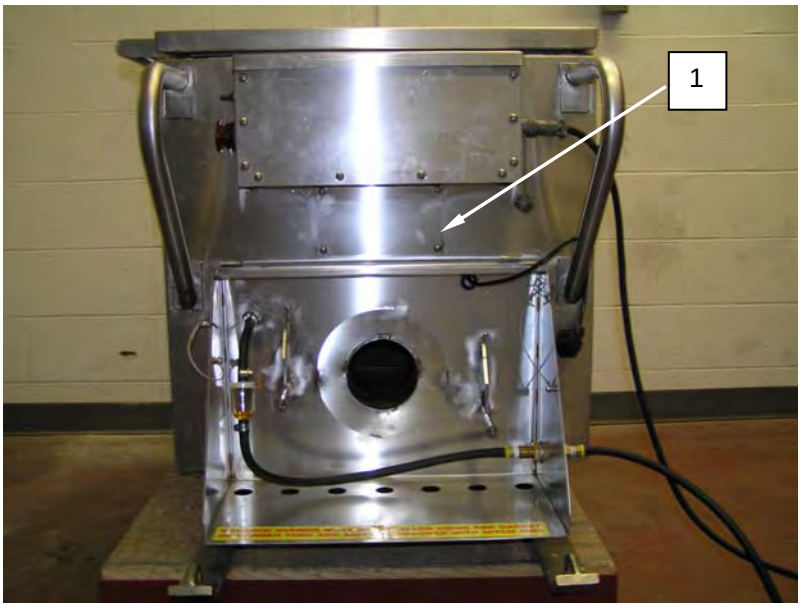


Figure 7. Secondary Access Panel Cover.

END OF TASK

END OF WORK PACKAGE

SERVICE MAINTENANCE

INVERTER, POWER STATIC
TEST, REPAIR

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit: Automotive (GMTK) (WP 0066, Item 4)

References

WP 0011

Personnel Required

Quartermaster Equipment Repairer 63J (1)
Utilities Equipment Repairer 52C (1)
Food Service Technician 3381 (1)

TEST

1. Connect the NATO cable plug to the vehicle NATO receptacle.
2. Move the inverter power switch to the ON position (Figure 1, Item 1).
3. Check status of LED indicators on TRH Inverter.
   a. Ensure the green LED Indicator (Figure 1, Item 2) is lit.
   b. If the red LED indicator (Figure 1, Item 3) is lit, start the vehicle and run the motor for the remainder of the test.

Figure 1. TRH Inverter.

TEST - CONTINUED

c. If there is no lit LED indicator perform the following actions:

(1) Verify connection of NATO plug cable to the vehicle NATO receptacle is secure.

(2) Check NATO plug fuse for proper function.

(3) Start vehicle to recharge battery.

(4) If another vehicle is available, connect the NATO plug cable to the NATO receptacle on the other vehicle to ensure a malfunction does not exist in the vehicle.

4. Press the reset button on the GFCI receptacle (Figure 2, Item 1) and the TRH Inverter circuit breaker (Figure 2, Item 2).

Figure 2. RFI Receptacle on TRH Inverter.

5. If the TRH Inverter is still not working properly, verify proper power to the GFCI receptacle by connecting a known good 110 VAC device (less than 300 watts).

a. If the known good device functions properly, the problem exists in the TRH. Refer to WP 0011 to troubleshoot the TRH tank electrical system.

b. If the known good device does not properly function, the problem exists in the inverter.

6. Repair the TRH Inverter IAW the repair procedures in this WP.

END OF TASK

REPAIR

Repair of the TRH Inverter consists of replacing the fuse in the TRH Inverter NATO cable plug.

1. Disconnect the NATO cable plug (Figure 3, Item 1) from the NATO receptacle.

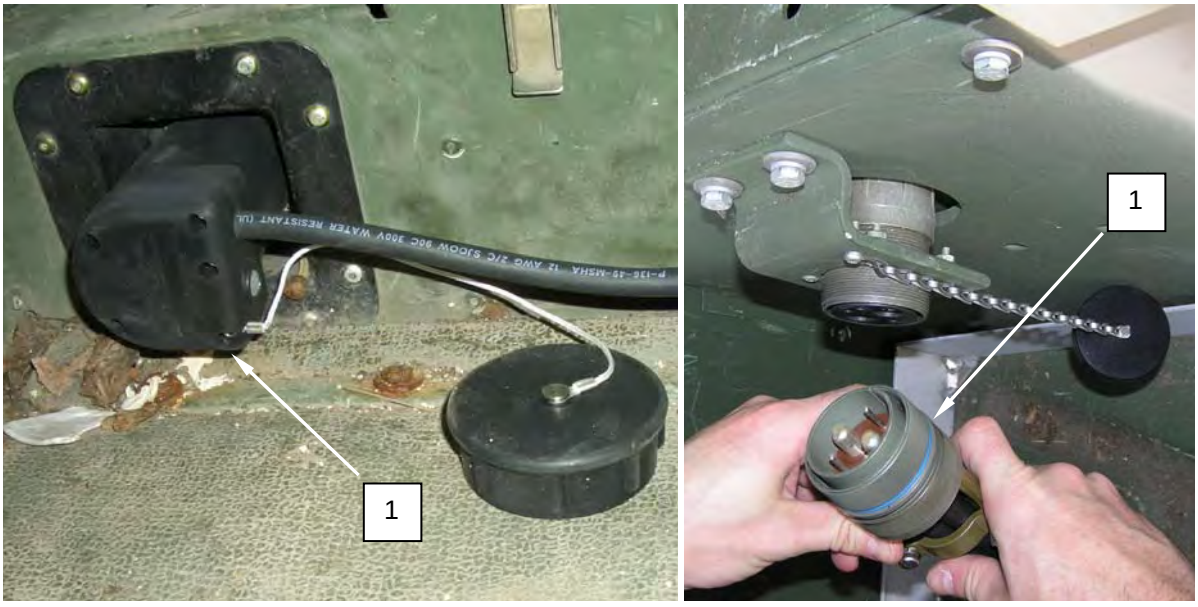


Figure 3. NATO Plug Receptacle.

2. Remove fuse cover (Figure 4, Item 1) on NATO cable plug by twisting open with a flat-tipped screwdriver.

Figure 4. Removing TRH Inverter Fuse.

REPAIR – CONTINUED

3. Remove fuse (Figure 5, Item 1) from fuse cover (Figure 5, Item 2).

4. Visually inspect fuse. If fuse is blown, replace.

Figure 5. Removing TRH Inverter Fuse.

5. Install fuse cover (Figure 6, Item 1) on NATO cable plug by pushing and twisting with a flat-tipped screwdriver.

Figure 6. Replacing TRH Inverter Fuse.

REPAIR – CONTINUED

6. Connect the NATO cable plug (Figure 7, Item 1) to the NATO receptacle.

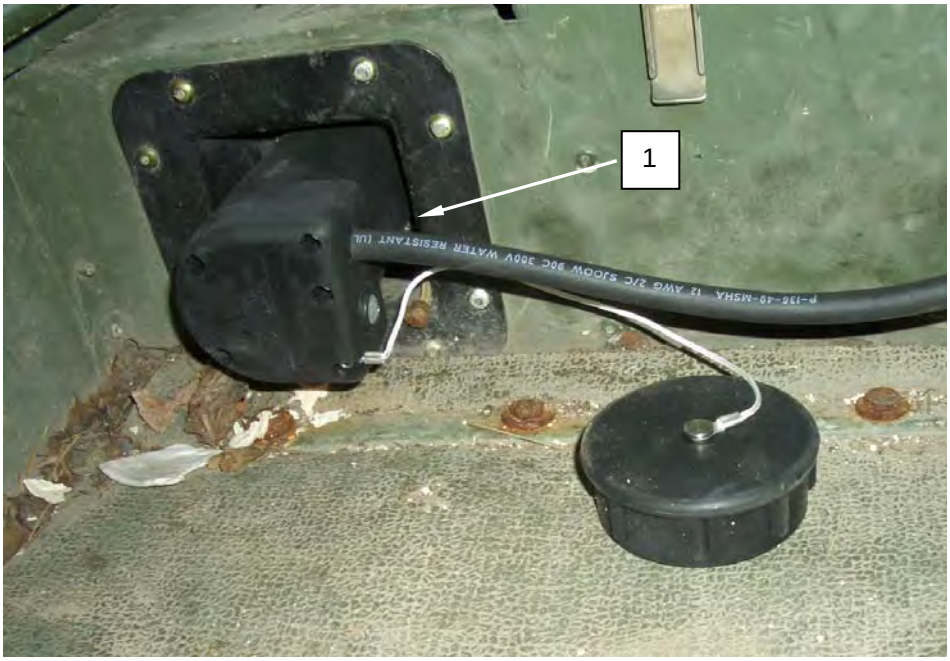


Figure 7. NATO Plug Receptacle Connection.

END OF TASK

END OF WORK PACKAGE

SERVICE MAINTENANCE

TANK SKID
REPLACE

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit: Automotive (GMTK) (WP 0066, Item 4)

Personnel Required

Quartermaster Equipment Repairer 63J (1) and Unspecified MOS (3)
Food Service Technician 3381 (4)

Materials/Parts

Oil and Water Absorbent Material (WP 0065, Item 1)
Wiping Rag (WP 0065, Item 13)

Equipment Condition

TRH Burner removed from TRH (WP 0026)
TRH Tank empty and removed from vehicle

REPLACE

WARNING

The TRH weighs approximately 320 pounds when empty and 525 pounds when full. Proper lifting technique is required to prevent damage to equipment and personnel. Always drain water tank before lifting or moving TRH. Four persons must be used to move the TRH onto its top, lifting with legs, not back, to prevent injury. Do not use the lid handles to move the TRH, use the two lift bars on the TRH.

1. Using a four-person lift, turn the TRH over so that it is resting on its top, elevating the skids.

2. Remove four retaining bolts, flat washers, and nuts from the bottom of the skid (two each on the front and two each on the back) (Figure 1, Item 1).

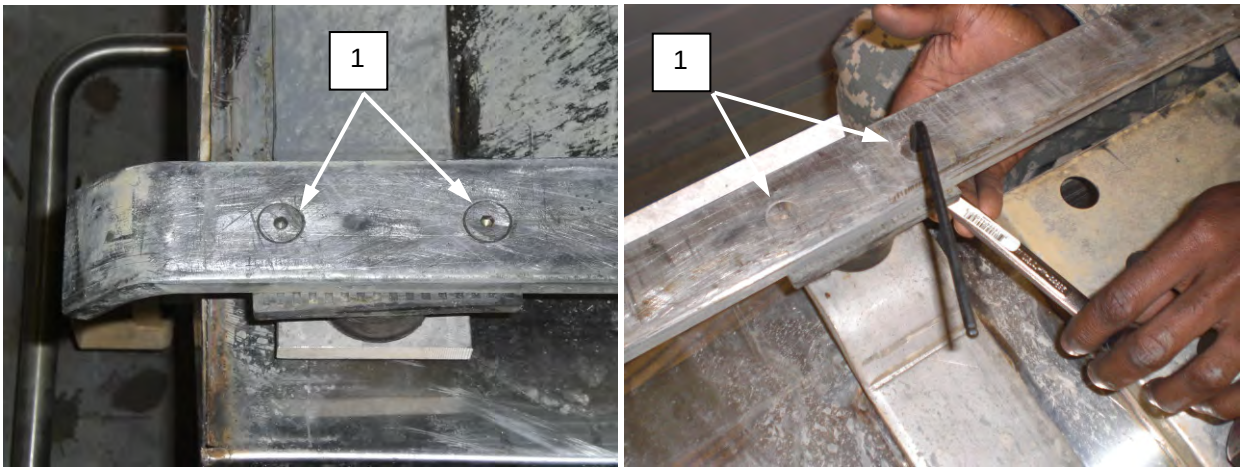


Figure 1. Removing Heater Skids.

REPLACE – CONTINUED

3. Remove skid.
4. Replace skid with a serviceable part from stock.
5. Replace four retaining bolts in bottom of skid (Figure 2, Item 1).

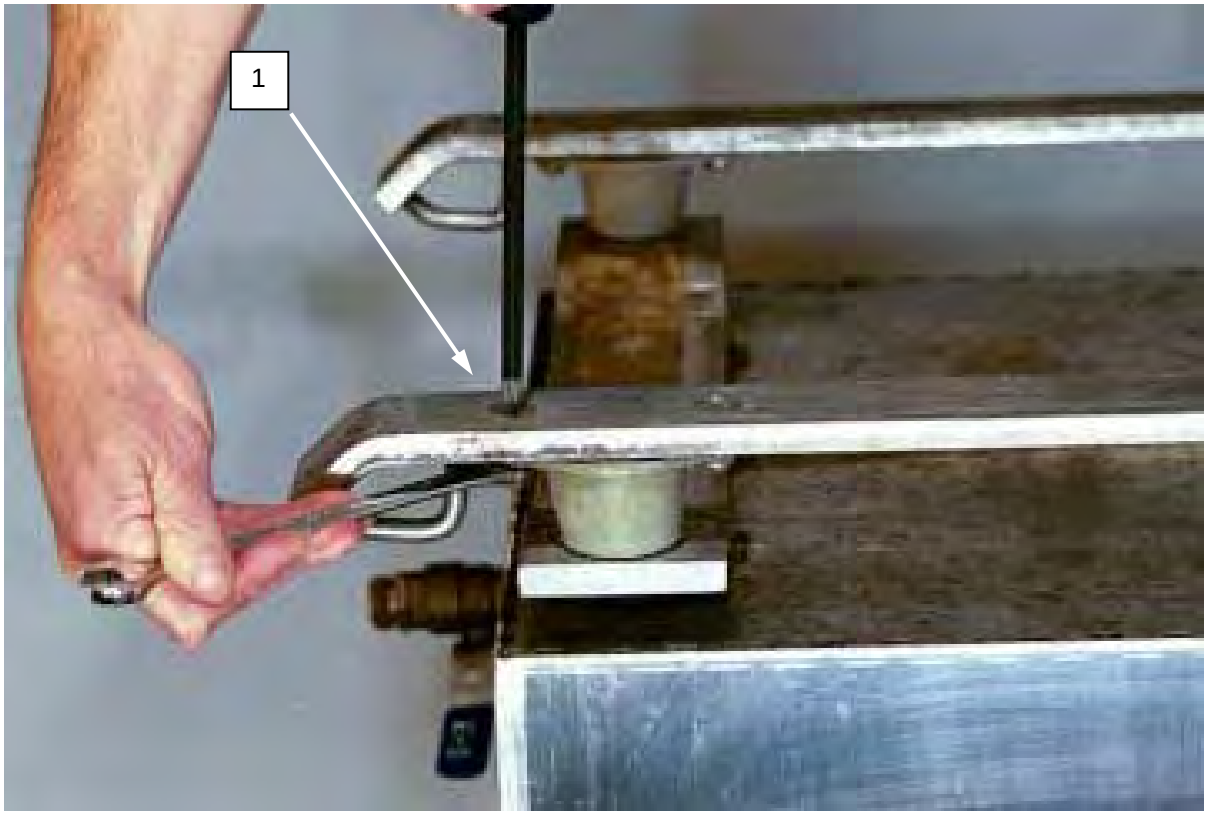


Figure 2. Removing Heater Skids.

6. Using a four-man lift, return the TRH to an upright position.
7. Install burner assembly and cover IAW WP 0026.

END OF TASK

END OF WORK PACKAGE

SERVICE MAINTENANCE

SHOCK MOUNT
REPLACE

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit: Automotive (GMTK) (WP 0066, Item 4)

Personnel Required

Quartermaster Equipment Repairer 63J (1) and Unspecified MOS (3)
Food Service Technician 3381 (4)

Materials/Parts

Oil and Water Absorbent Material (WP 0065, Item 1)
Wiping Rag (WP 0065, Item 13)

Equipment Condition

TRH Burner removed from TRH (WP 0026)
TRH Tank empty and removed from vehicle

REPLACE

WARNING

The TRH weighs approximately 320 pounds when empty and 525 pounds when full. Proper lifting technique is required to prevent damage to equipment and personnel. Always drain water tank before lifting or moving TRH. Four (4) persons must be used to move the TRH onto its top, lifting with legs, not back, to prevent injury. Do not use the lid handles to move the TRH, use the two lift bars on the TRH.

1. Using a four-person lift, turn the TRH over so that it is resting on its top, elevating the skids.
2. Remove four retaining bolts, flat washers, and nuts from the bottom of the skid (two each on the front and two each on the back) (Figure 1, Item 1). Remove skids.
3. Remove two shock mount retaining bolts from top of shock mount (one on front shock mount and one on rear shock mount) (Figure 1, Item 2).

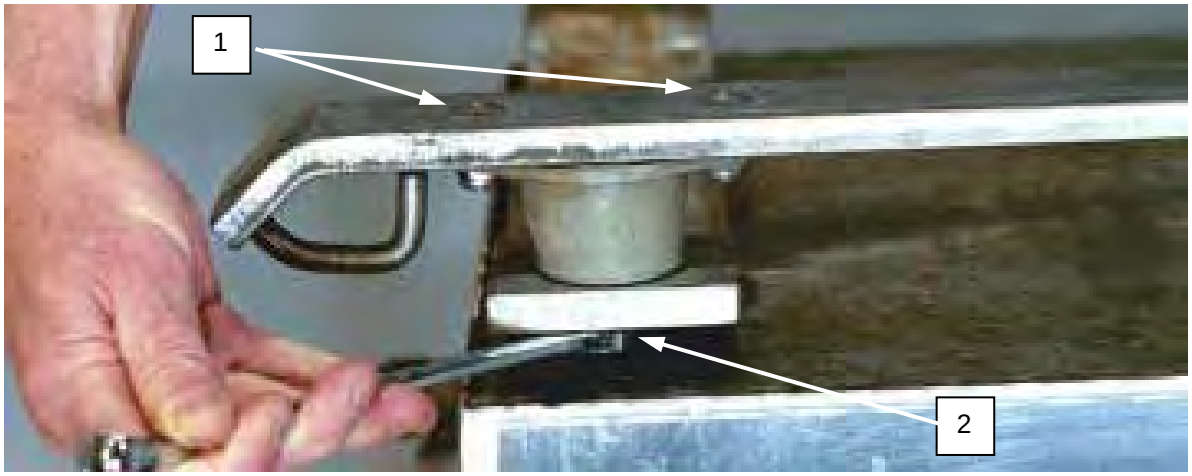


Figure 1. Removing Shock Mounts.

REPLACE – CONTINUED

4. Remove shock mount and replace with a serviceable part from stock.

5. Replace two shock mount retaining bolts from top of shock mounts (one on front shock mount and one on rear shock mount) (Figure 2, Item 2). Hand tighten only.

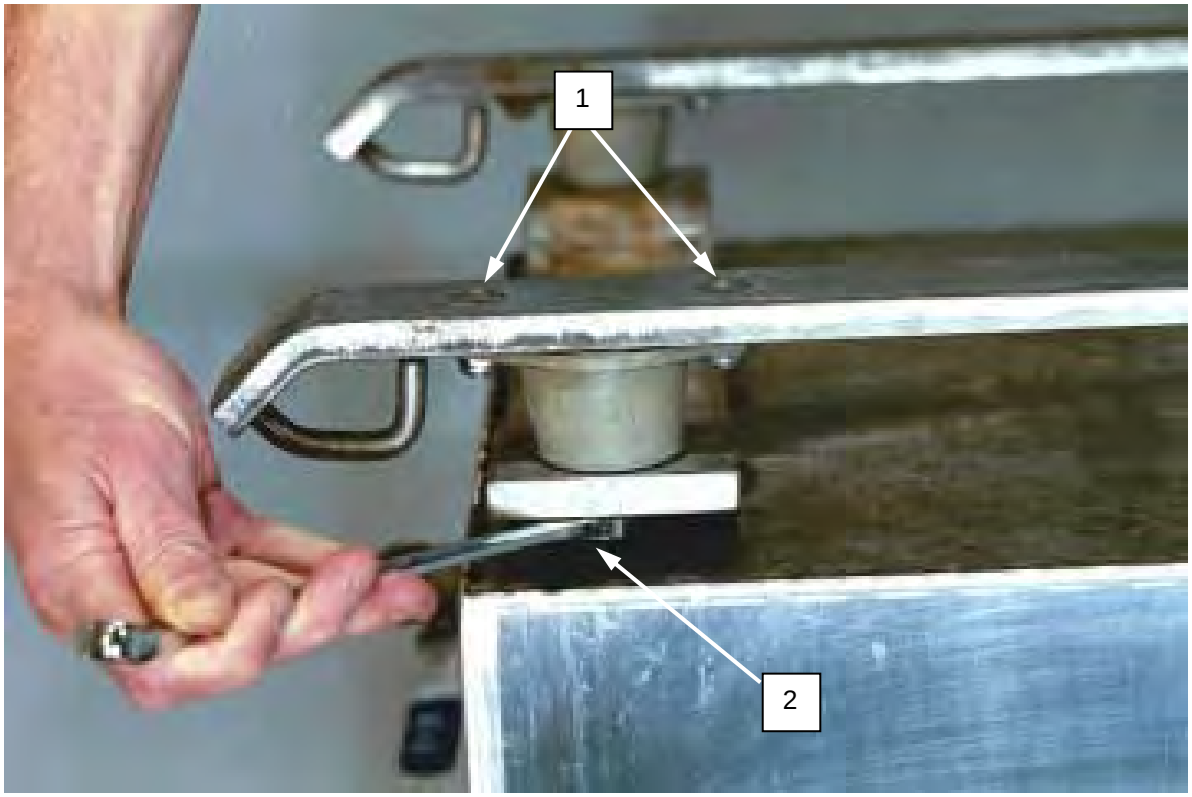


Figure 2. Removing Shock Mounts.

6. Position skid on shock mounts.

7. Replace four retaining bolts in bottom of skid.

8. Wrench tighten shock mount bolts.

9. Using a four-man lift, return the TRH to an upright position.

10. Install burner assembly and cover IAW WP 0026.

END OF TASK

END OF WORK PACKAGE

SERVICE MAINTENANCE

MULTI-FUEL BURNER REPAIR

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit: Automotive (GMTK) (WP 0066, Item 4)

Materials/Parts

Piston Assembly Parts Kit (WP 0054, Item 22)
Oil and Water Absorbent Material (WP 0065, Item 1)
Chemical and Oil Protective Gloves (WP 0065, Item 9)
Industrial Goggles (WP 0065, Item 10)

Materials/Parts - continued

Wiping Rag (WP 0065, Item 13)

Personnel Required

Quartermaster Equipment Repairer 63J
Food Service Technician 3381

Equipment Condition

TRH Burner removed from TRH (WP 0026)

REPAIR

WARNING

Do not attempt to service a TRH Burner in the vicinity of any open flame. Prevent a possible fire hazard by having absorbent materials or fuel mats on hand to absorb any spillage. Failure to observe safety precautions may result in injury or death to personnel.

WARNING

Fuel under pressure can spray with great force. Keep eyes and skin protected from fuel contamination with goggles, gloves and protective clothing. Failure to do so may result in injury or death to personnel.

Damage to the TRH Burner may not be detected through troubleshooting procedures or visual inspection of the TRH burner. If a TRH burner experiences difficulty operating after completion of the troubleshooting process, use the following procedures to breakdown and inspect the TRH burner. Replace any components showing obvious signs of damage.

REPAIR - CONTINUED

Burner Disassembly

NOTE

Ensure that fuel has been drained from the TRH burner IAW WP 0026.

1. Unscrew control box retaining screw (Figure 1, Item 1) and remove the control box.

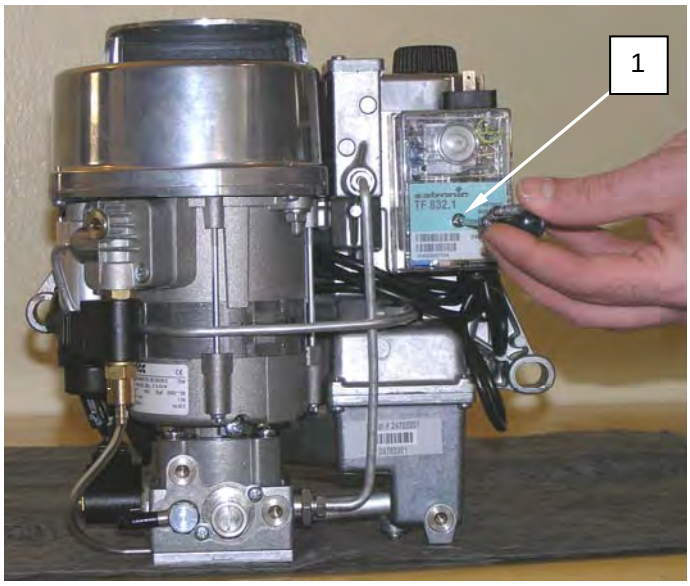


Figure 1. Control Box Removal and Fuel Drainage.

NOTE

The air tube may occasionally separate from the flame tube. If this happens, remove flame tube from atomizing chamber.

2. Remove the front flange of the lower fan housing by removing the four screws (Figure 2, Item 1) to expose the atomizing chamber (Figure 2, Item 2). It is not necessary to remove the air tube/flame tube assembly (Figure 2, Item 3) from the front flange (Figure 2, Item 4).

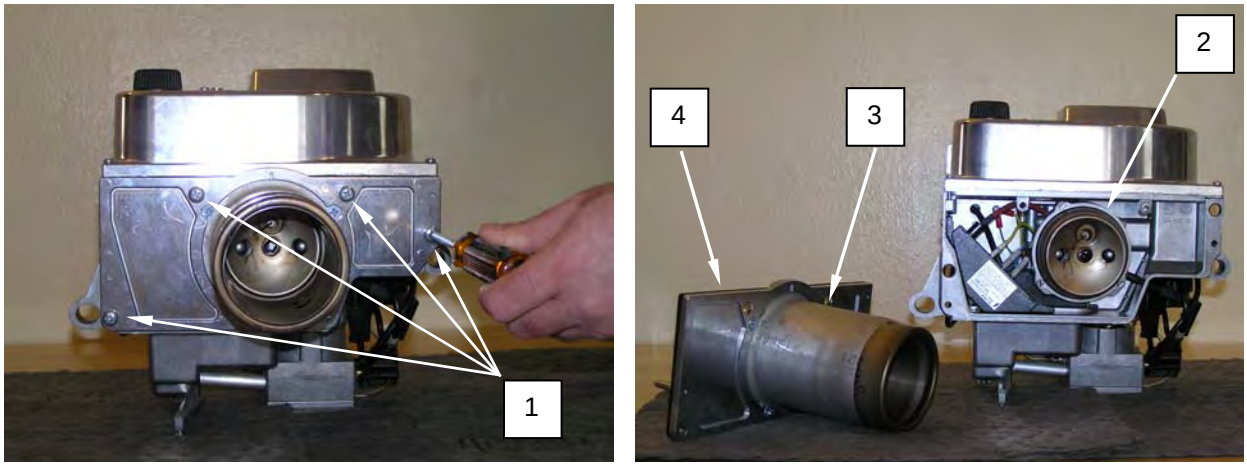


Figure 2. Lower Fan Housing Flange Removal.

REPAIR - CONTINUED

3. Removal and installation of the atomizing chamber does not require tools. Remove the atomizing chamber by pulling directly out (Figure 3, Item 1). Once removed, pull the igniter cable spade connector from the ignition transformer (Figure 3, Item 2).

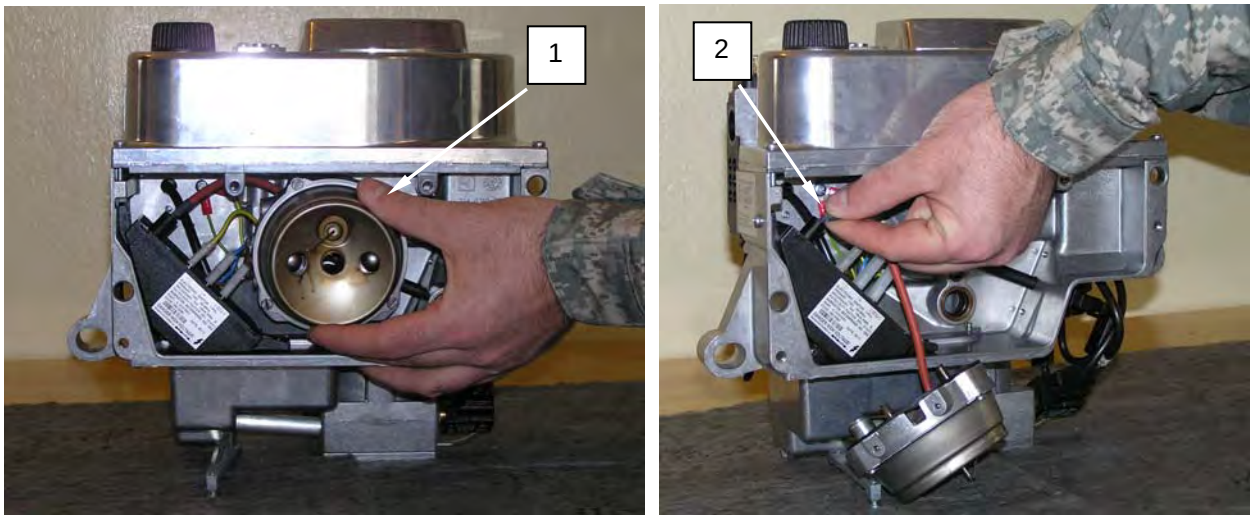


Figure 3. Atomizing Chamber Removal.

4. Place atomizing chamber in protective container to prevent dirt intrusion.

5. Turn burner upside down and disconnect primer port tubing at base of fuel pump (Figure 4, Item 1).

6. Remove primer port connector from the base of the air solenoid with the adjustable wrench (Figure 4, Item 2).

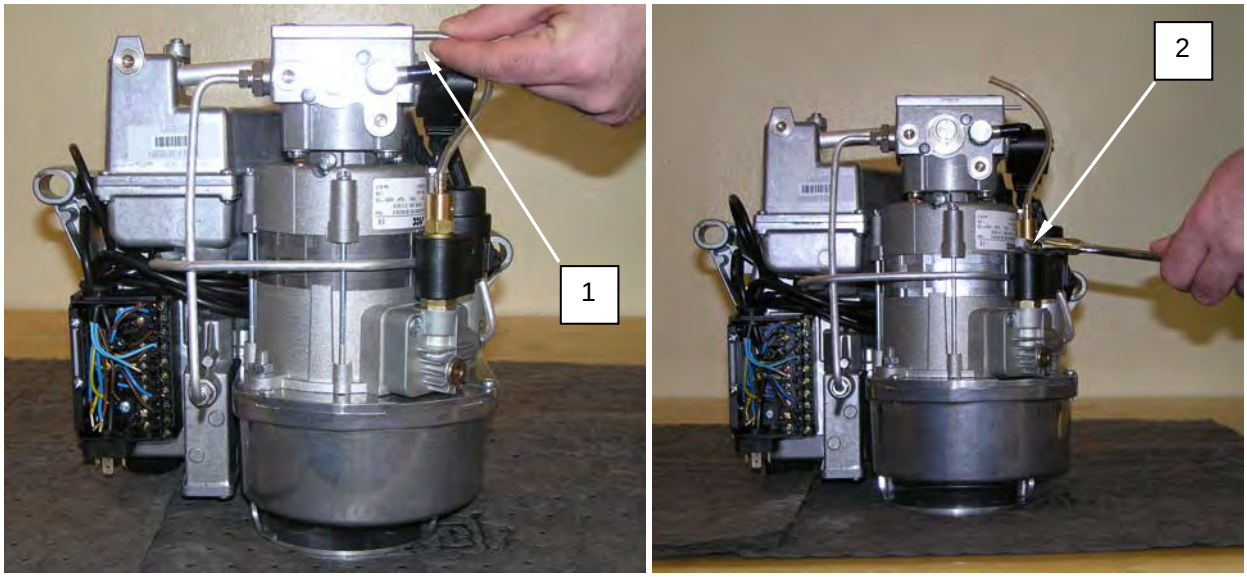


Figure 4. Primer Port Tubing and Primer Port Connector Removal.

REPAIR - CONTINUED

7. Remove air solenoid washers from air solenoid coil (Figure 5, Item 1).

8. Remove air solenoid coil from valve body (Figure 5, Item 2).

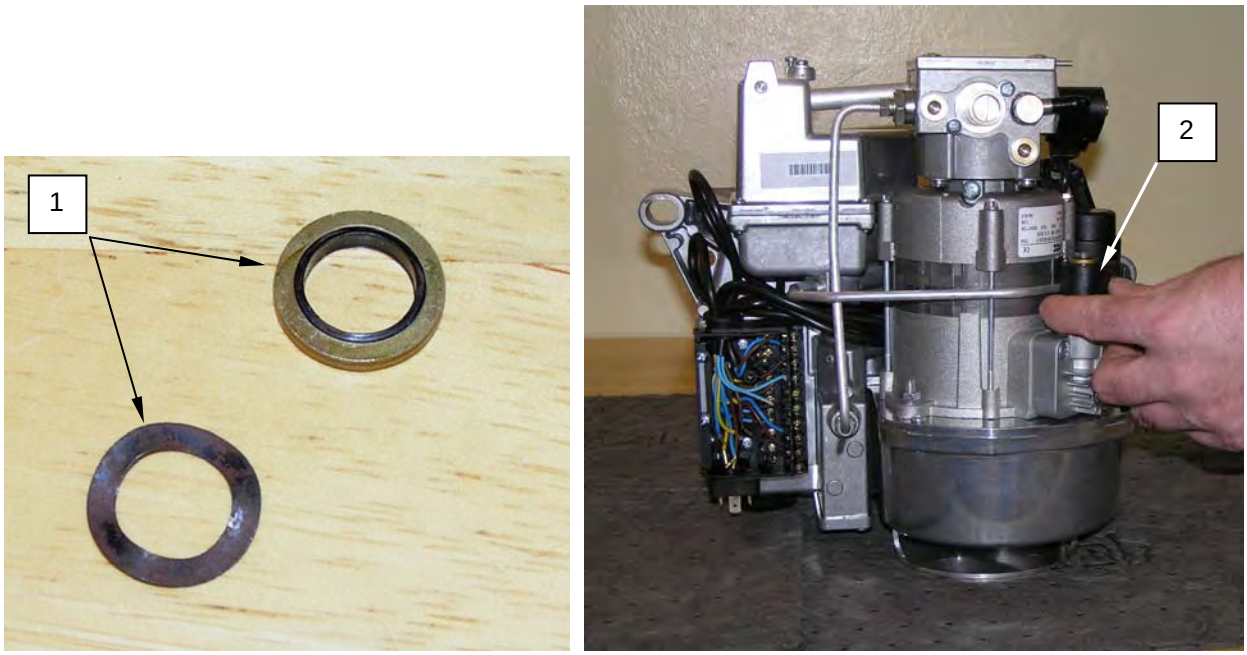


Figure 5. Air Solenoid Coil and Air Solenoid Removal.

9. Tag and unplug air solenoid from power cable (Figure 6, Item 1).

10. Unscrew hex nuts on opposite ends of metal air line (Figure 6, Item 2) that leads from the air compressor.

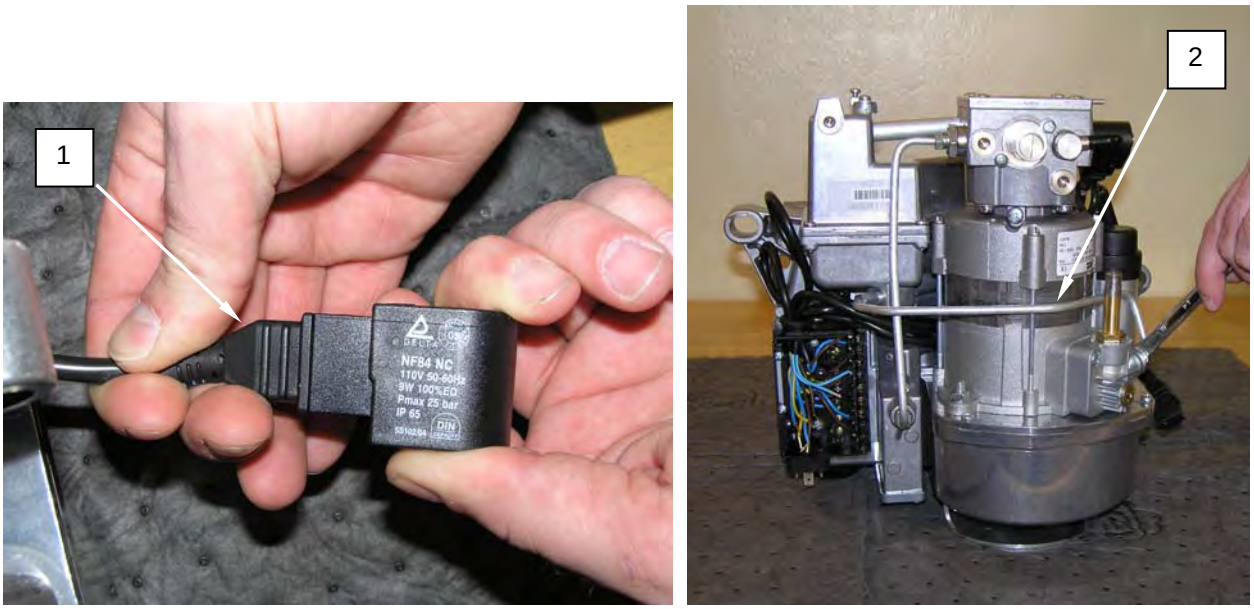


Figure 6. Air Solenoid Coil and Air Line Removal.

REPAIR – CONTINUED

11. Remove the metal air line (Figure 7, Item 1) and set in a clean place.
12. Unscrew both metal fuel line connections and remove the metal fuel line (Figure 7, Item 2).
13. Remove five screws that hold the fuel sump to the lower fan housing (Figure 7, Item 3 and Item 4).

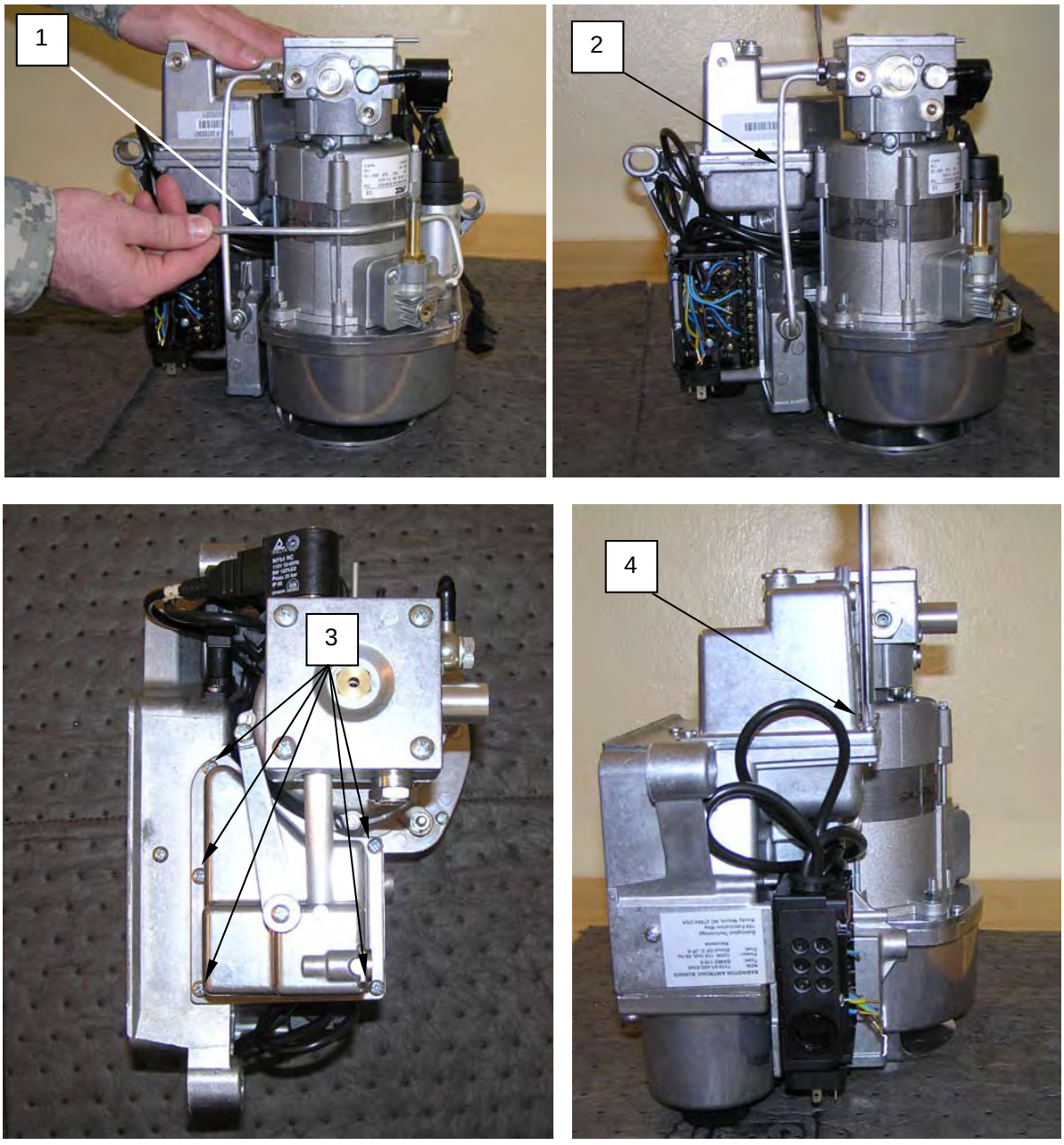


Figure 7. Air Line, Fuel Line, and Fuel Sump Removal.

REPAIR – CONTINUED

14. While gently twisting the fuel crossover tube (Figure 8, Item 1), slowly slide the sump (Figure 8, Item 2) horizontally away from the pump to disengage the fuel crossover tube from the sump pump (Figure 8, Item 3), taking care not to damage the overflow safety device. Remove the fuel sump (Figure 8, Item 2) and crossover tube (Figure 8, Item 1).

15. Tag and disconnect fuel solenoid power cable (Figure 8, Item 4) from fuel solenoid coil (Figure 8, Item 5).

16. Remove fuel solenoid coil retaining nut (Figure 8, Item 6) from pump fuel solenoid coil.

17. Remove fuel solenoid coil (Figure 8, Item 7).

NOTE

The side panel of the burner control box base may be removed for ease of access.

NOTE

Before disconnecting TRH Burner wires, tag the wires to aid installation procedures.

18. Disconnect all wires from the burner control box base (Figure 8, Item 8).

19. Pull control box wires through access hole in bottom of control box.

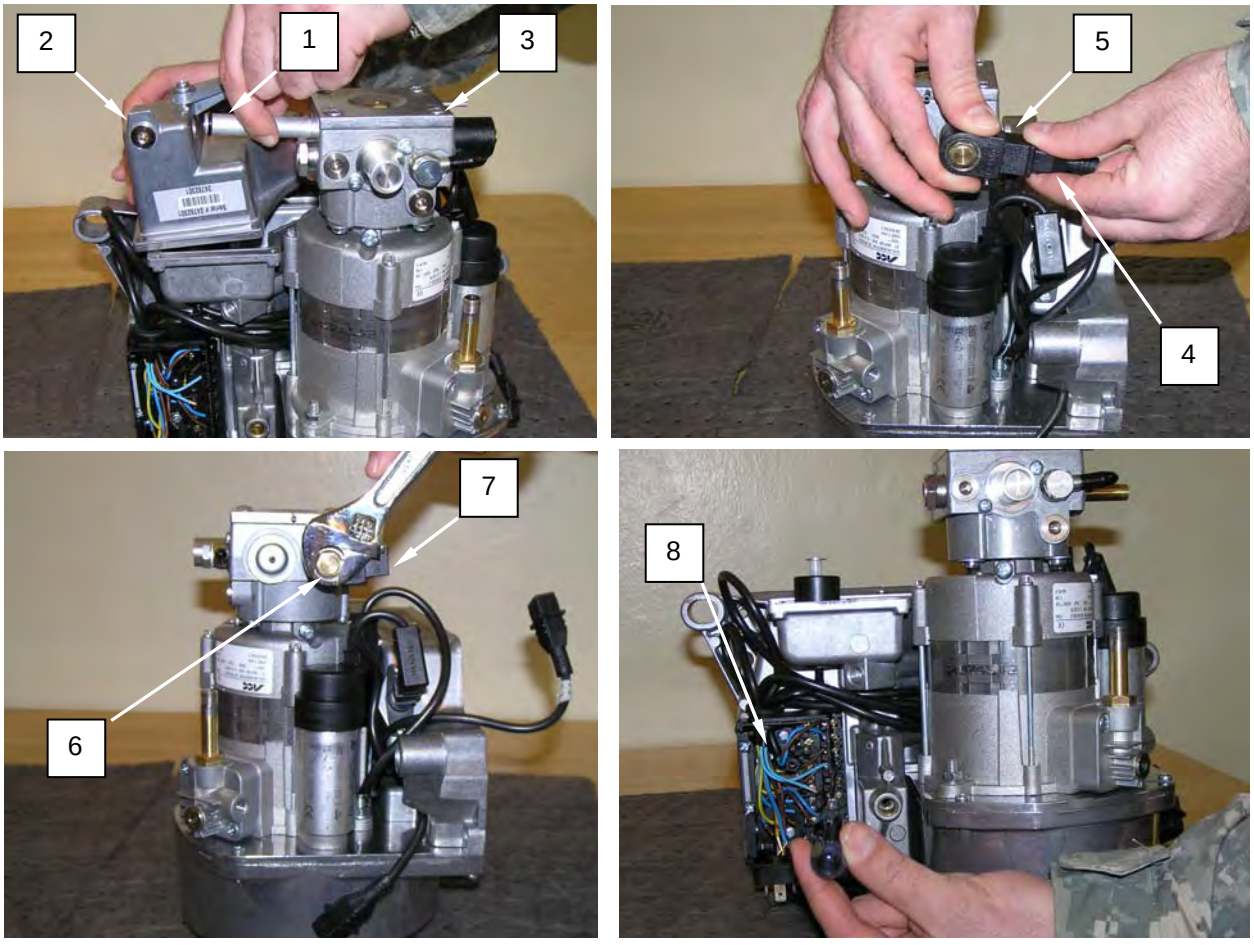


Figure 8. Fuel Sump and Fuel Solenoid Power Cable.

REPAIR – CONTINUED

20. Pull photocell (Figure 9, Item 1) straight out from photocell base (Figure 9, Item 2).

21. Push detent button to disconnect photocell (Figure 9, Item 2) from photocell power cable (Figure 9, Item 3).

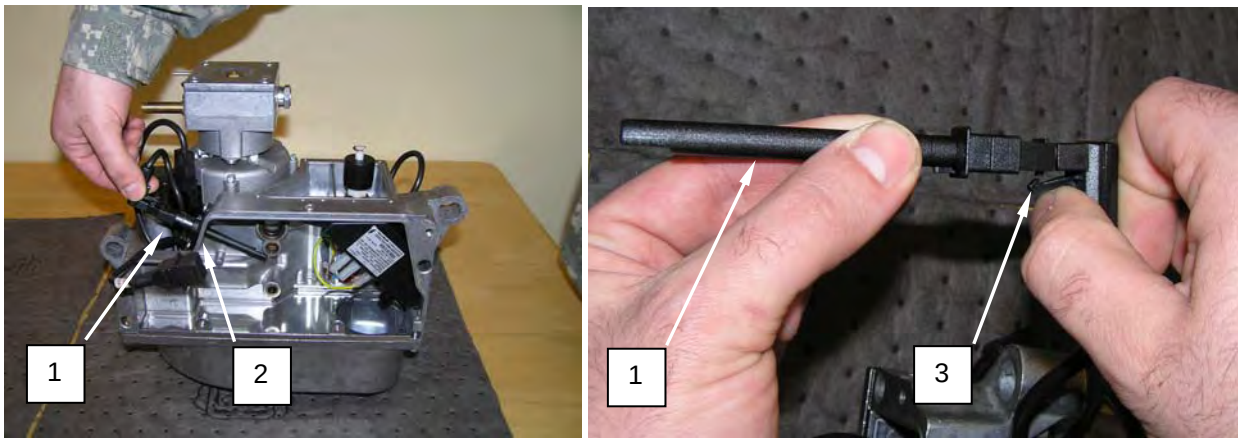


Figure 9. Photocell and Power Pack Removal.

22. Remove the two hex nuts (Figure 10, Item 1 and Item 2) and flat washers, which hold the motor mounts to the upper fan housing, from their posts.

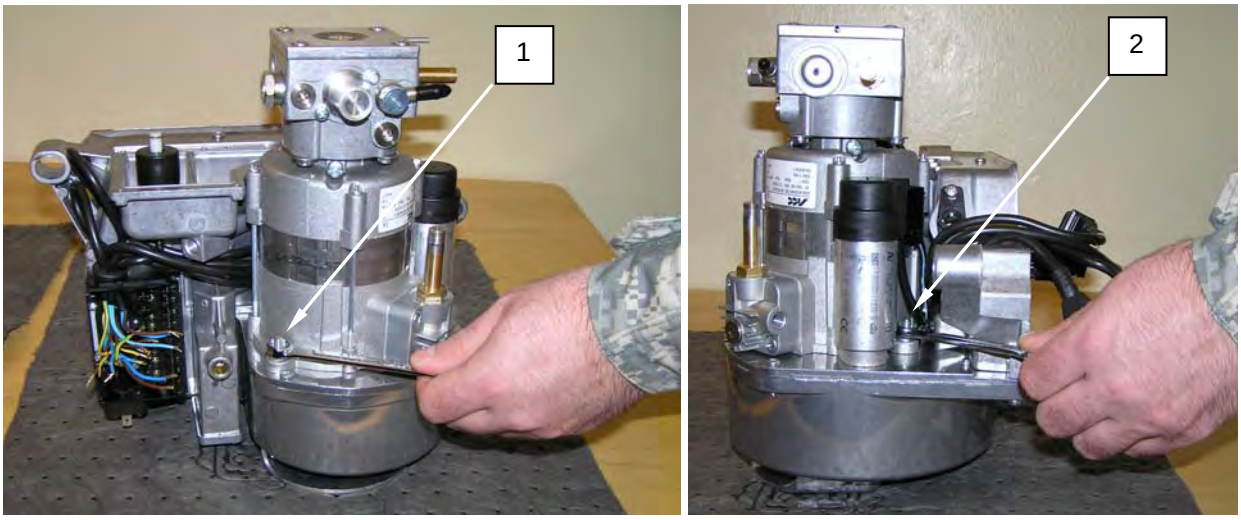


Figure 10. Photocell and Power Pack Removal.

REPAIR – CONTINUED

23. Remove motor power cable (Figure 11, Item 1).

24. Remove the entire power pack (consisting of the motor, compressor, fuel pump, and blower wheel) (Figure 11, Item 2).

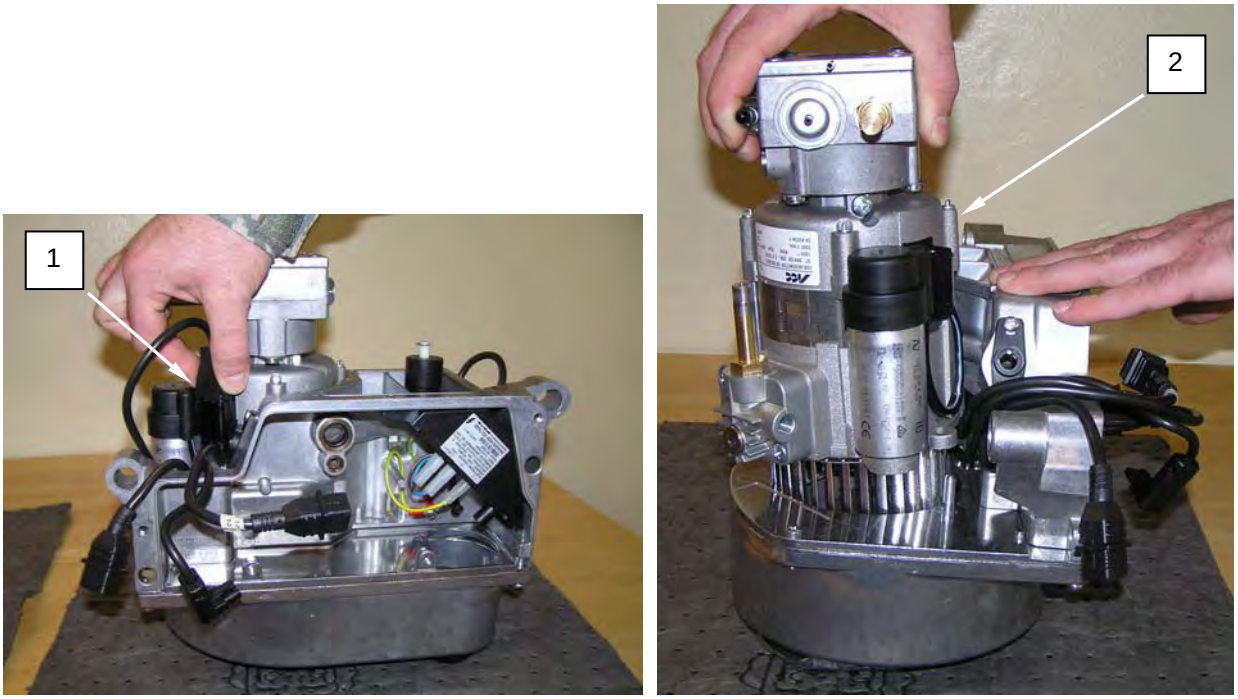


Figure 11. Photocell and Power Pack Removal.

25. Remove two screws retaining photocell base and remove the photocell base (Figure 12, Item 1).

26. Remove two screws holding control box base (Figure 12, Item 2) to lower fan housing.

27. Remove control box base (Figure 12, Item 2).

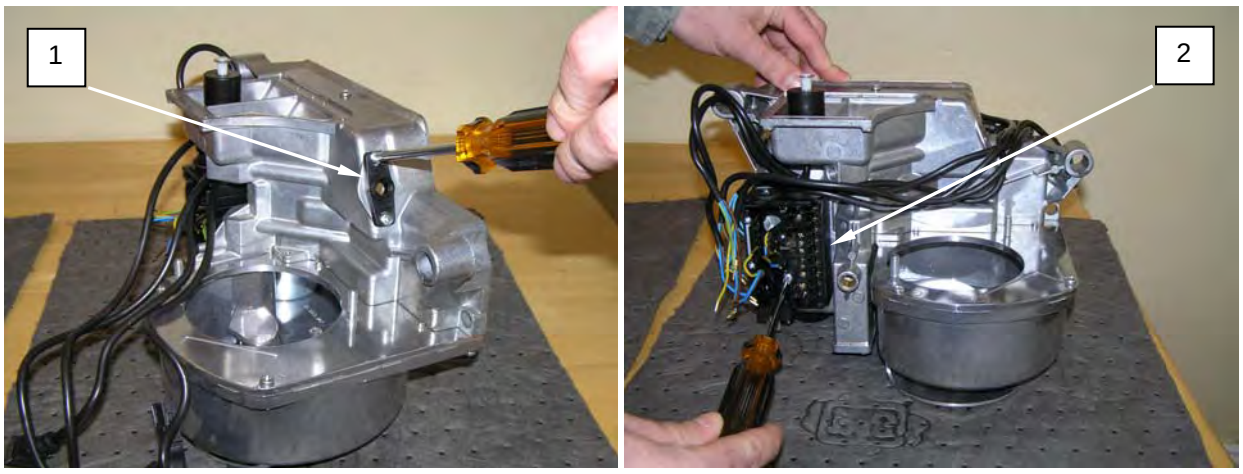


Figure 12. Photocell Base and Control Box Base Removal.

REPAIR – CONTINUED

28. Remove overflow safety float switch retaining clip (Figure 13, Item 1). If necessary, use a small flat-tip screwdriver to pry off the retaining clip.

29. Pull the overflow safety float (Figure 13, Item 2) out of the lower housing assembly.

30. Unscrew the overflow safety float sensor (Figure 13, Item 3).

31. Remove the overflow safety float switch retaining nut (Figure 13, Item 4) and O-ring.

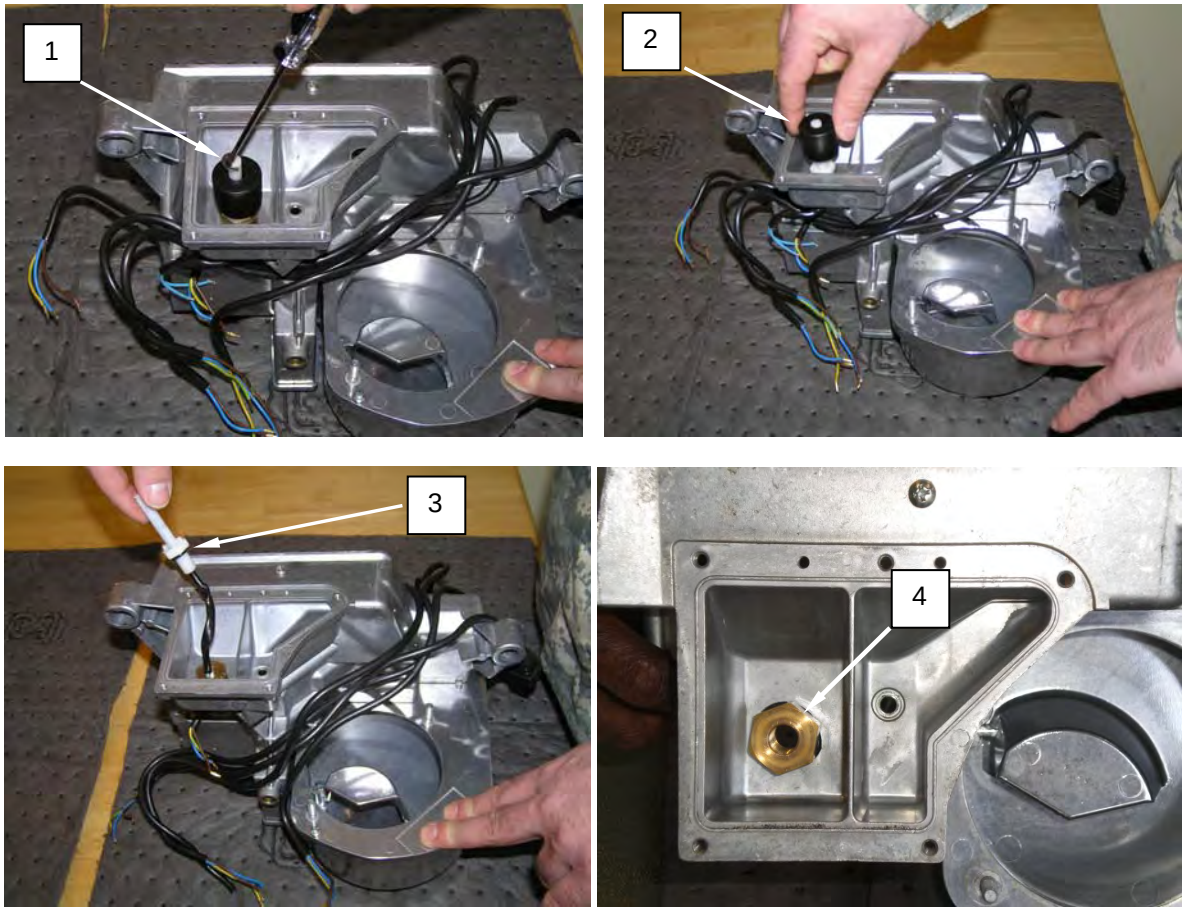


Figure 13. Overflow Safety Device Removal.

REPAIR – CONTINUED

32. Disconnect spade connections (Figure 14, Item 1) from ignition transformer (Figure 14, Item 2). If necessary, use a flat-tip screwdriver to pry off spade connections.

33. Remove ignition transformer retaining screws (Figure 14, Item 3 and Item 4).

34. Remove ground wire retaining screw (Figure 14, Item 5) and ignition transformer.

35. Remove power cable and ground wire from lower fan housing.

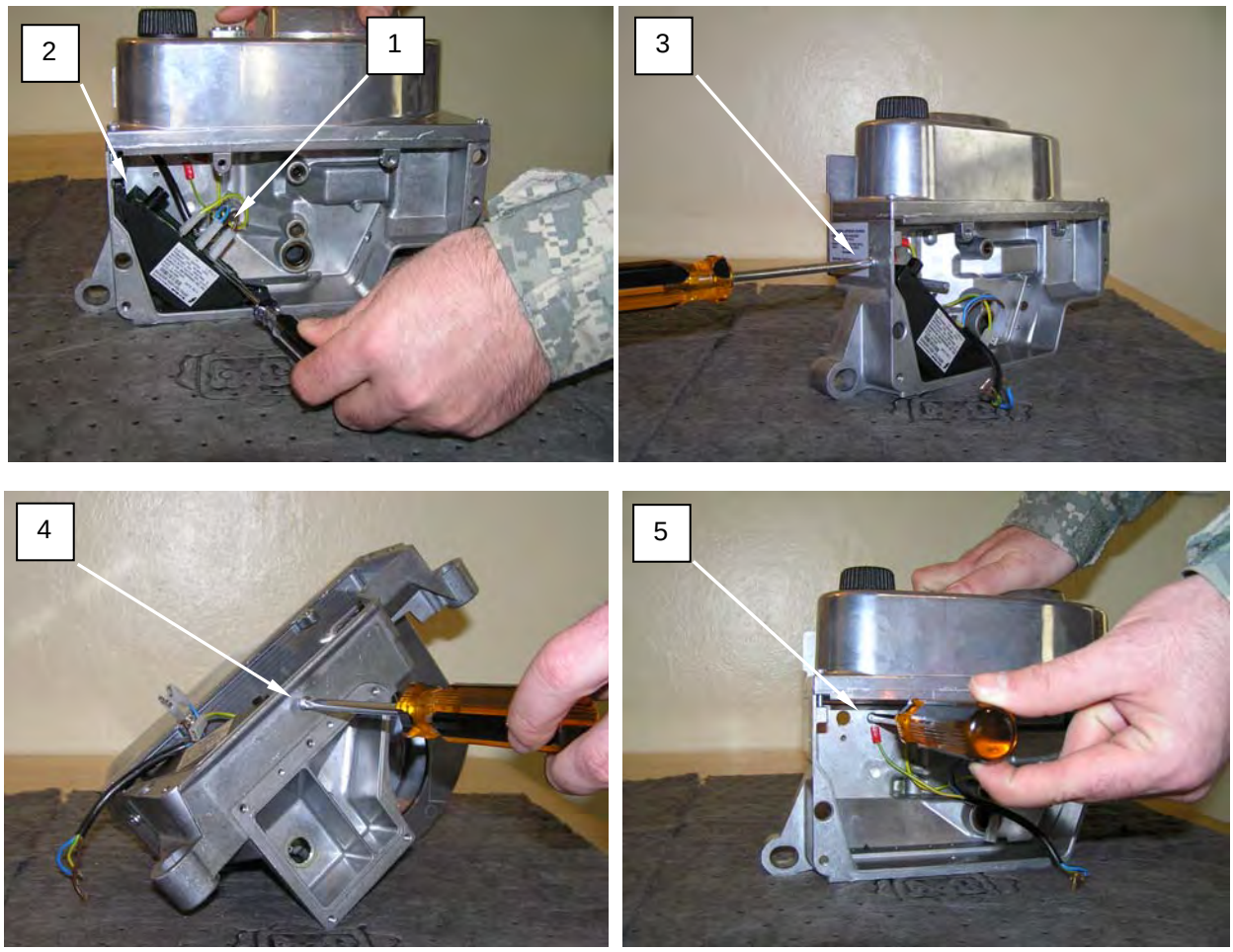


Figure 14. Spade Connection and Transformer Retaining Screw Removal.

REPAIR – CONTINUED

36. Remove four screws that retain upper fan housing to intermediate motor mounting plate (two screws on both sides) (Figure 15, Items 1 and 2).

37. Separate upper fan housing (Figure 15, Item 3) and intermediate motor mounting plate (Figure 15, Item 4).

38. Remove blower control knob retaining screw (Figure 15, Item 5).

39. Remove blower control knob (Figure 15, Item 6).

40. Remove blower control knob printed index (Figure 15, Item 7).

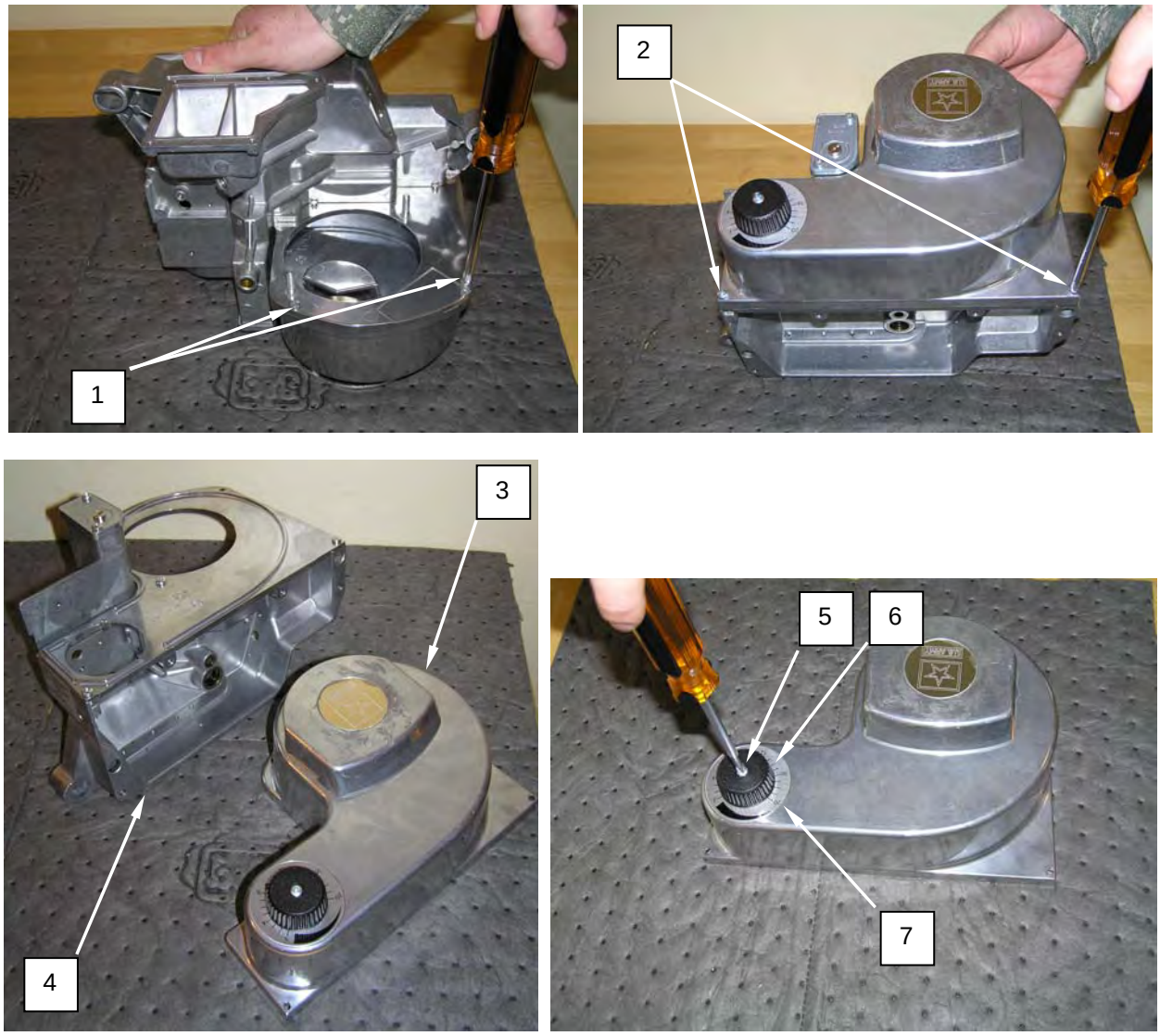


Figure 15. Upper Fan Housing and Blower Control Knob Removal.

REPAIR – CONTINUED

41. Remove blower-regulating scroll from upper fan housing (Figure 16, Item 1).

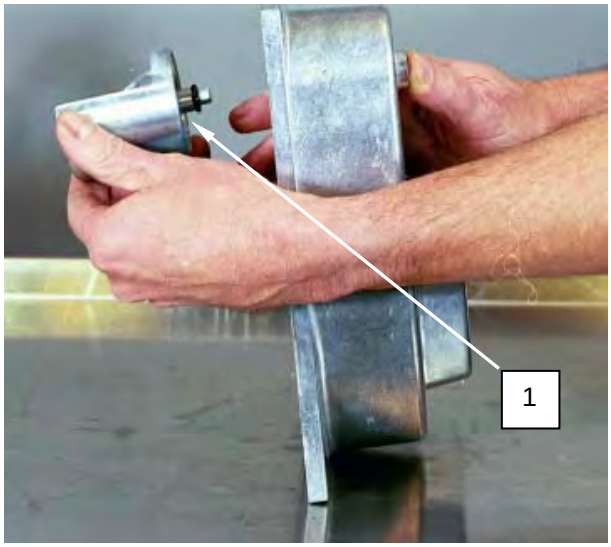


Figure 16. Blower Regulating Scroll Removal.

42. Remove the two screws (Figure 17, Item 1) retaining the cover from the flow control module.

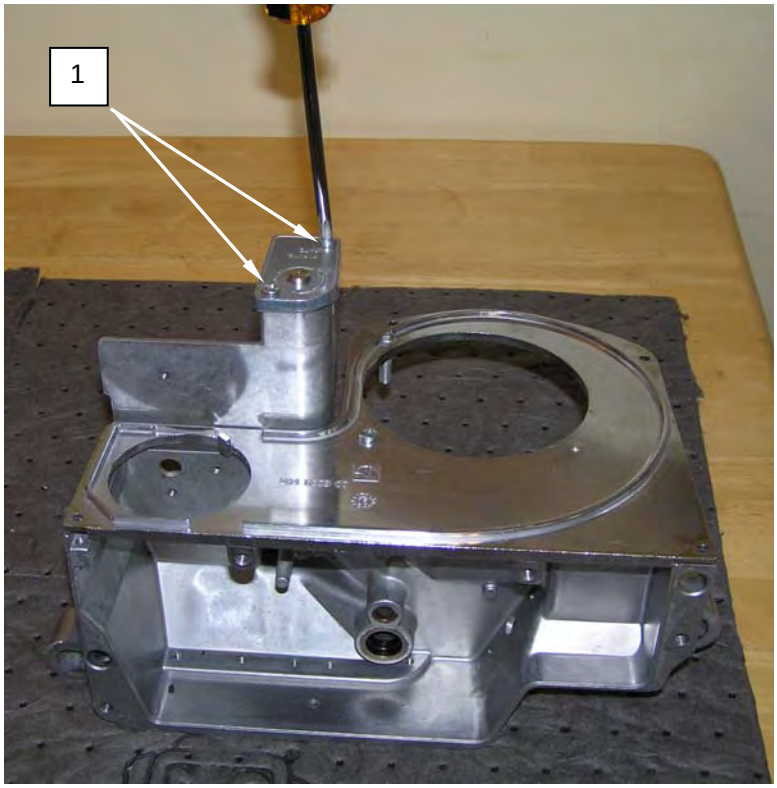


Figure 17. Air Inlet Cover Removal.

REPAIR – CONTINUED

43. Remove flow control module cover (Figure 18, Item 1).

44. Remove flow control knob and cam (Figure 18, Item 2) by pushing flow control knob through the flow control module cover (Figure 18, Item 3).

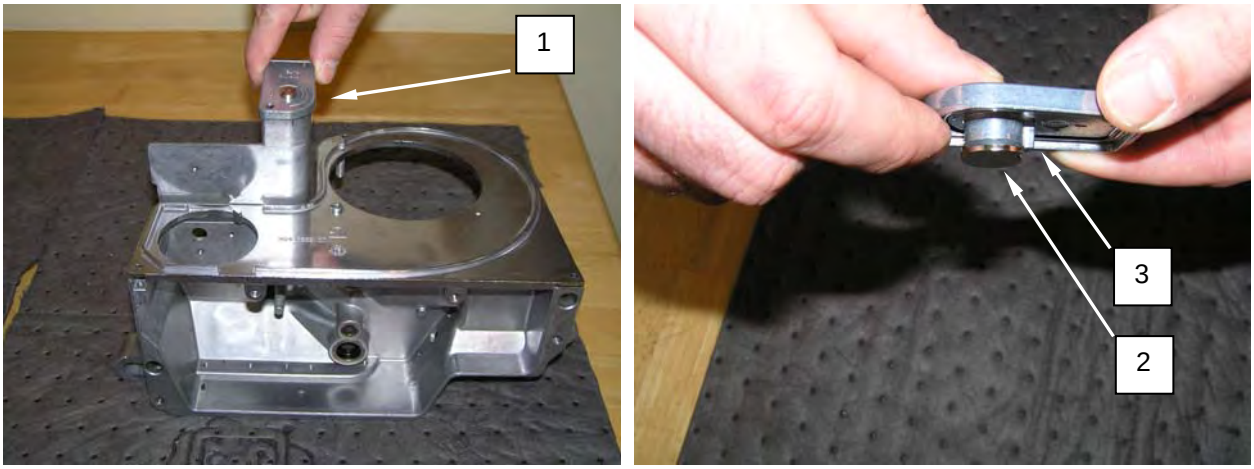


Figure 18. Flow Control Module Removal.

45. Loosen two retaining screws (Figure 19, Item 1) that secure the pump assembly.

46. Lift out pump assembly (Figure 19, Item 2).

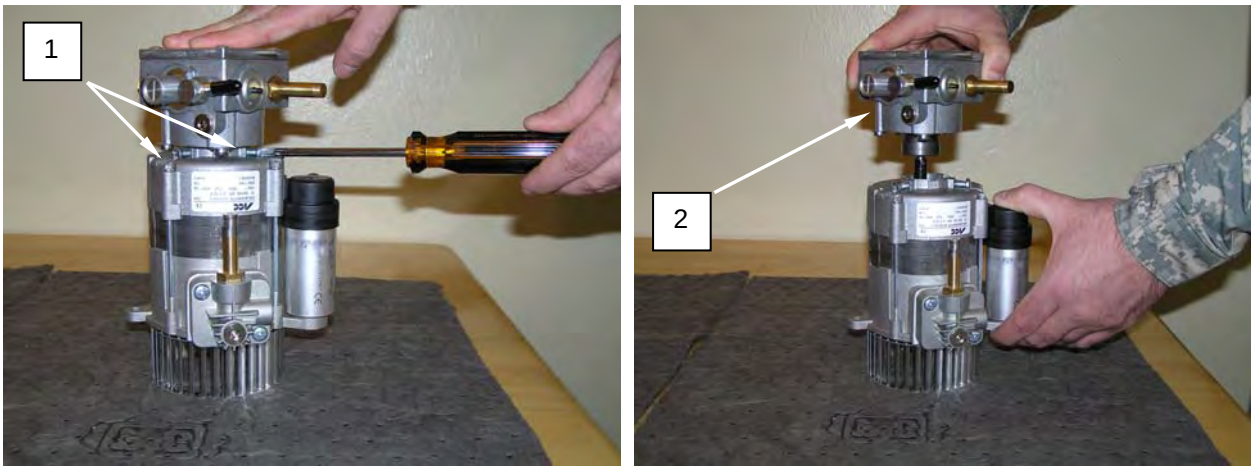


Figure 19. Pump Assembly Removal.

REPAIR – CONTINUED

NOTE

The fuel solenoid body has a spring, plunger, and guide inside. Ensure that parts do not get lost.

47. Remove the nylon pump coupling (Figure 20, Item 1) from the pump shaft.

48. Remove fuel solenoid post (Figure 20, Item 2).

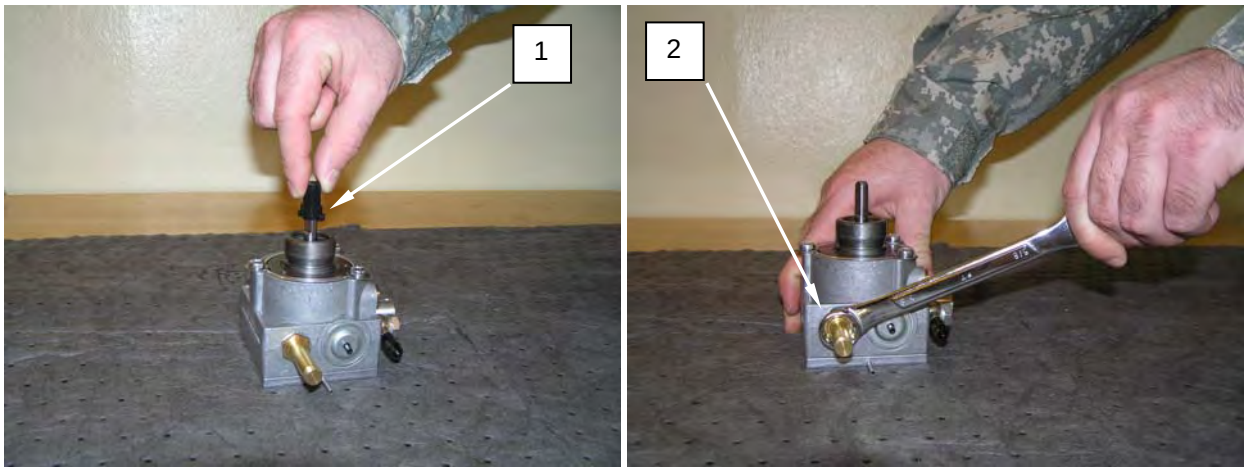


Figure 20. Pump Coupling and Fuel Solenoid Removal.

49. Loosen blower wheel retaining set screw (Figure 21, Item 1).

50. Remove blower wheel (Figure 21, Item 2).

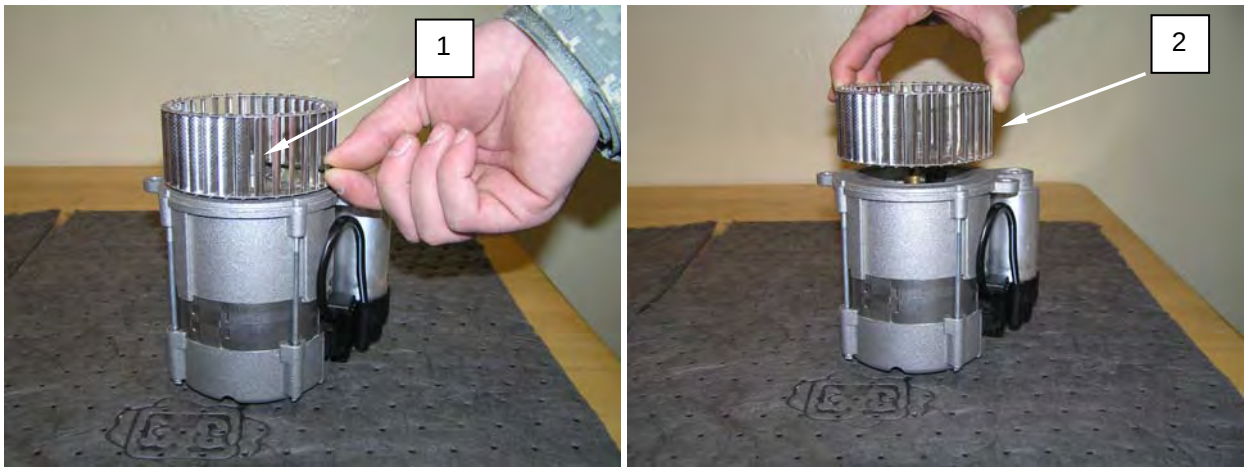


Figure 21. Blower Wheel Removal.

REPAIR – CONTINUED

51. Remove air compressor filter plug (Figure 22, Item 1) and O-ring.

52. Remove small compressor air filter by pulling lightly with needle-nose pliers (Figure 22, Item 2).

Figure 22. Compressor Air Filter Removal.

53. Loosen and remove air solenoid body (Figure 23, Item 1).

54. Remove compressor head mounting screws (Figure 23, Item 2).

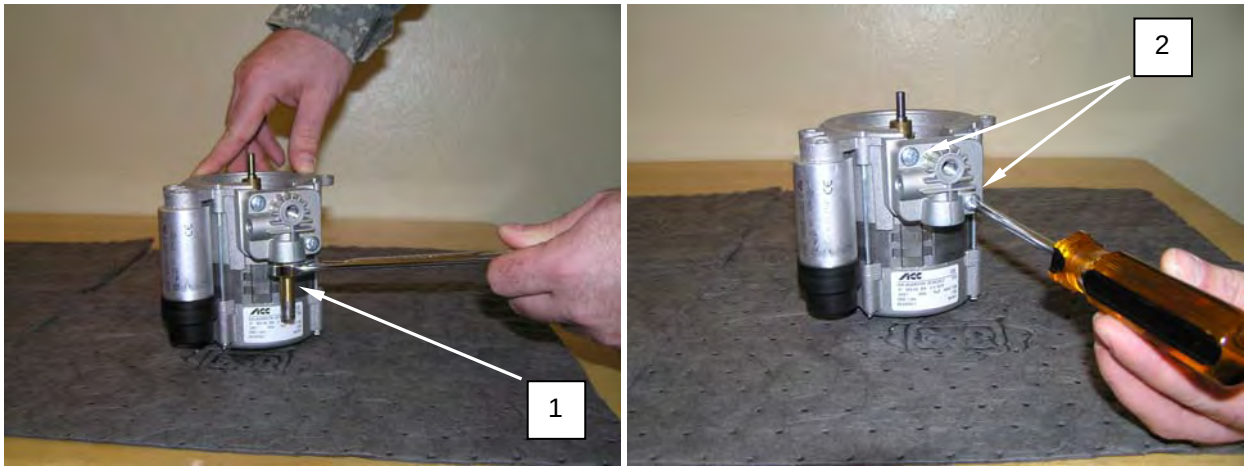


Figure 23. Solenoid and Compressor Removal.

REPAIR – CONTINUED

55. Remove compressor head and shim (Figure 24, Item 1), if included.

NOTE

Only remove the compressor piston ring and O-ring if necessary to replace. A new piston O-ring and compressor piston ring must be used.

56. Remove compressor piston ring (Figure 24, Item 2) to expose compressor piston O-ring.

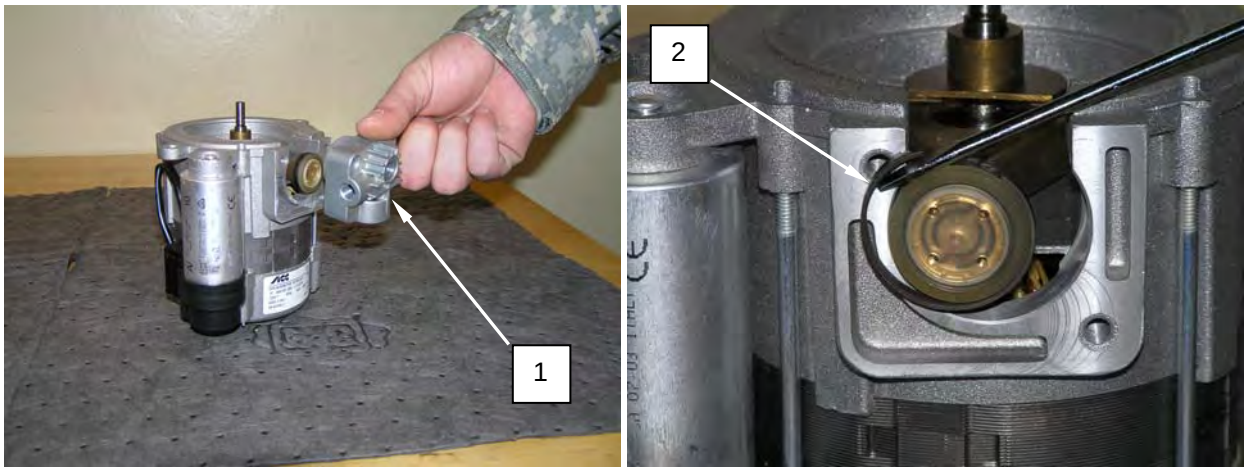


Figure 24. Compressor Head and Piston Ring Removal.

57. Remove piston O-ring (Figure 25, Item 1) and set aside.

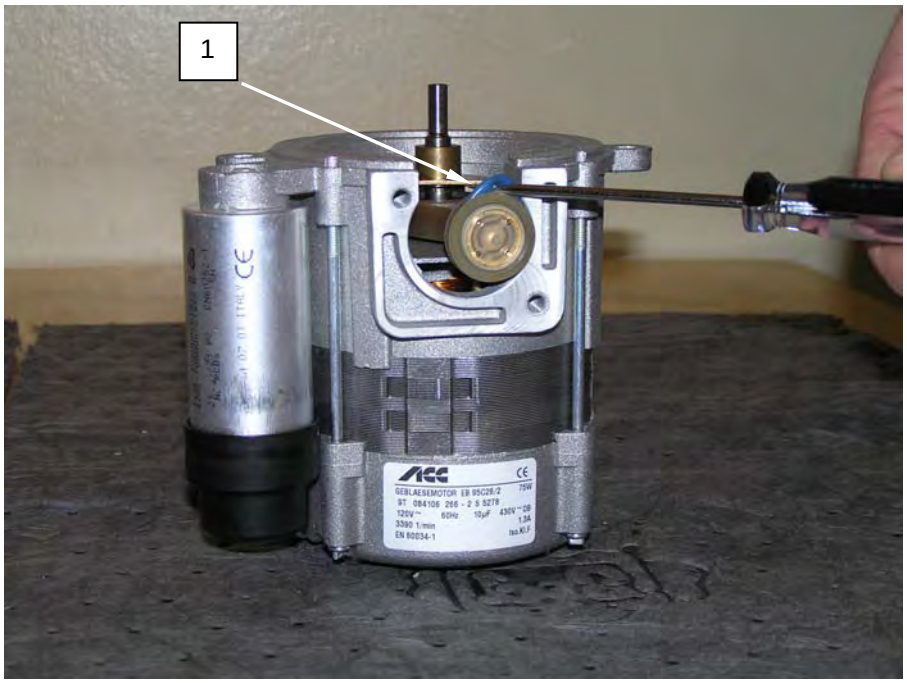


Figure 25. Piston O-ring Removal.

END OF TASK

REPAIR – CONTINUED

Burner Reassembly

1. If removed, replace compressor piston O-ring with new item from stock, being careful not to damage or tear the piston O-ring (Figure 26, Item 1).

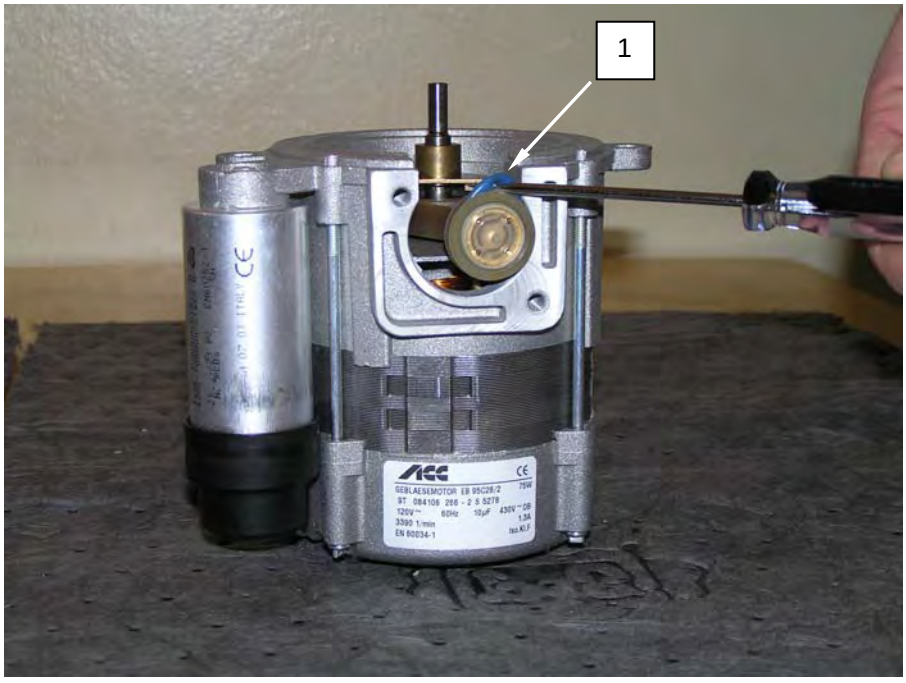


Figure 26. Replacing the Piston O-ring.

2. If removed, replace compressor piston ring (Figure 27, Item 1) with new item from stock, over piston O-ring.

3. Install the compressor head and shim, if equipped (Figure 27, Item 2).

Figure 27. Compressor Head and Piston Ring Replacement.

REPAIR – CONTINUED

4. Install two compressor head mounting screws (Figure 28, Item 1).

NOTE

The air solenoid has a hole at the tip. The fuel solenoid does not.

5. Install and tighten air solenoid body (Figure 28, Item 2). Do not over tighten.

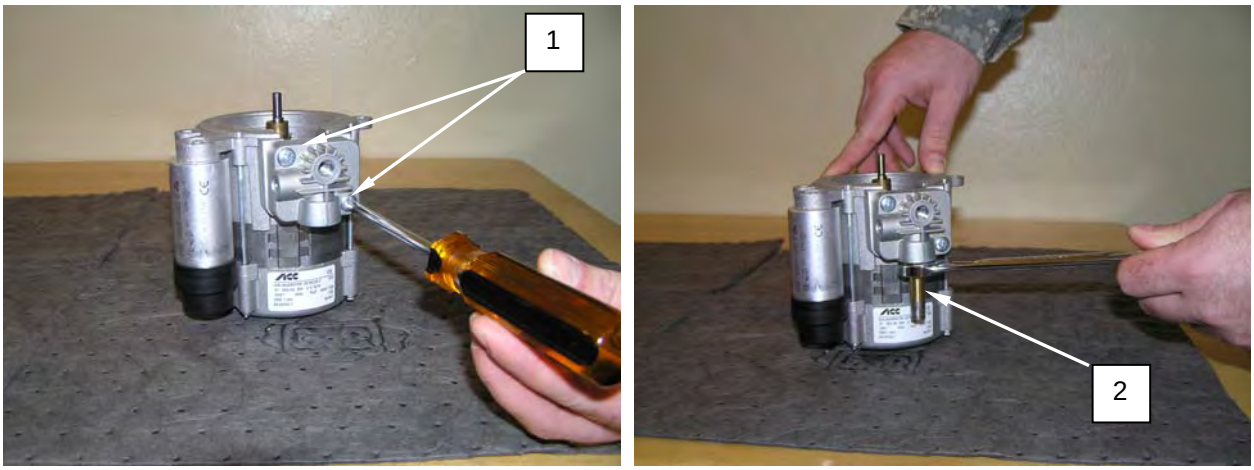


Figure 28. Solenoid and Compressor Replacement.

NOTE

The compressor air filter will fit in both holes on the compressor. Ensure placement in the proper hole.

6. Install small compressor air filter by pushing lightly with needle-nose pliers (Figure 29, Item 1).

7. Install air compressor filter plug (Figure 29, Item 2) and O-ring. Do not over tighten.

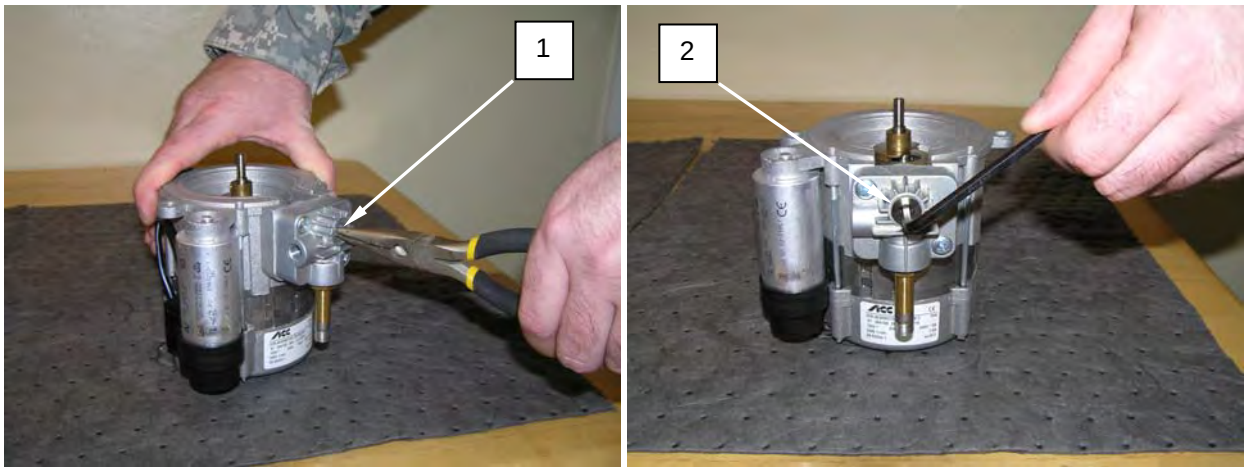


Figure 29. Compressor Air Filter Replacement.

REPAIR – CONTINUED

8. Install the blower wheel (Figure 30, Item 1) by placing it back over the shaft. Ensuring that the screw will tighten against the flat spot on the shaft.

9. Tighten blower wheel retaining set screw (Figure 30, Item 2).

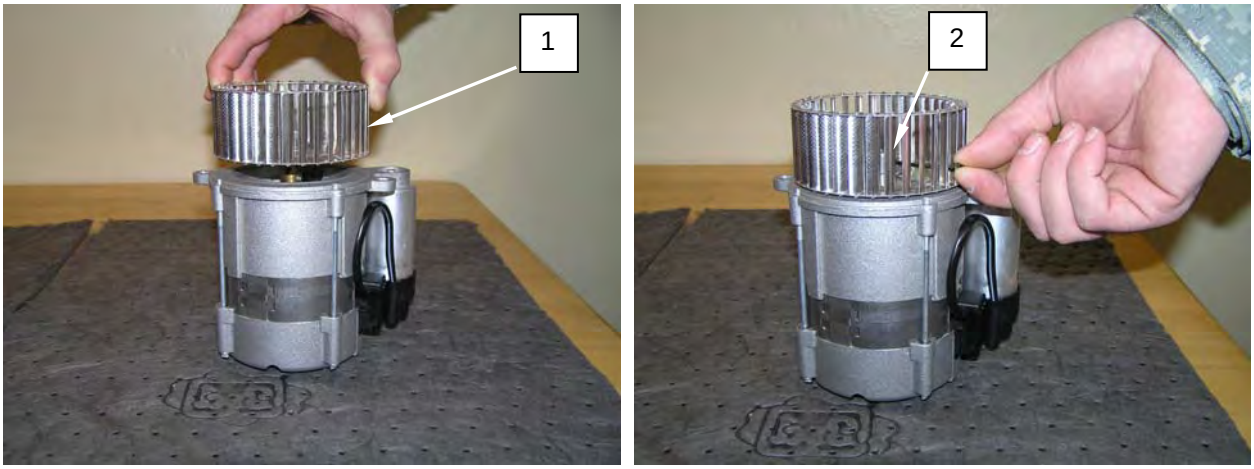


Figure 30. Blower Wheel Replacement.

10. Install fuel solenoid body and tighten (Figure 31, Item 1), ensuring proper O-ring placement. Do not over tighten.

11. Install nylon pump coupling on pump shaft. Ensure that the flat side of the shaft coordinates with the slot on the pump coupling (Figure 31, Item 2).

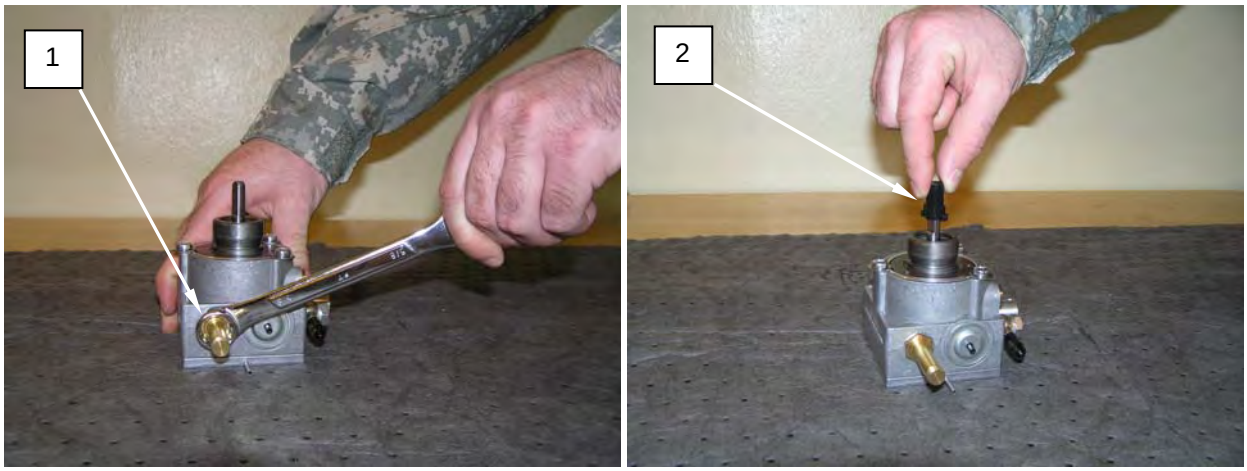


Figure 31. Pump Coupling and Fuel Solenoid Replacement.

REPAIR – CONTINUED

12. Install pump assembly onto pump shaft ensuring that the nylon teeth line up with the pump assembly. If necessary, rotate the blower fan until the pump assembly slides all the way against the motor. Align the corner of the pump assembly to the right of the primer port connection with the air solenoid body (Figure 32, Item 1).

13. Tighten the pump retaining screws (Figure 32, Item 2) until seated.

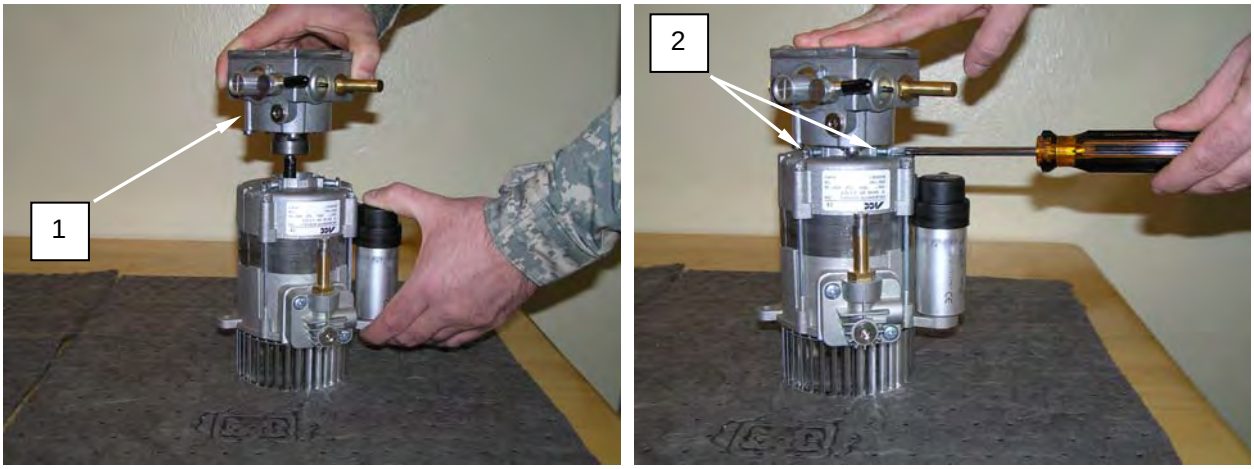


Figure 32. Pump Assembly Replacement.

14. Install flow control module insert, insuring small O-ring seal is between insert and lower fan housing.

15. Insert fuel regulating cam (Figure 33, Item 1) back into flow control module cover (Figure 33, Item 2).

16. Install flow control module cover (Figure 33, Item 3).

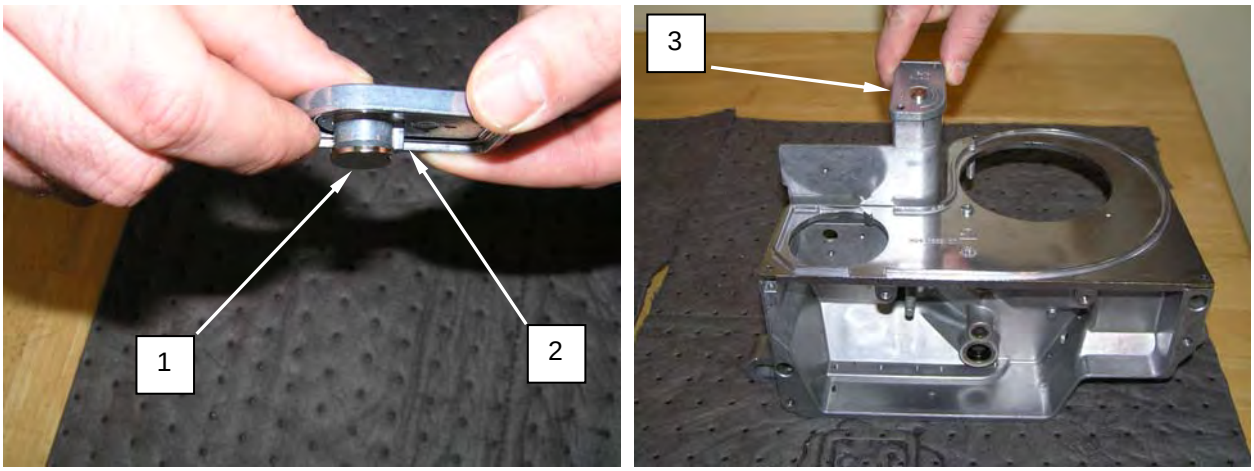


Figure 33. Flow Control Module Replacement.

REPAIR – CONTINUED

17. Install and tighten the two screws to secure the flow control module cover (Figure 34, Item 1).

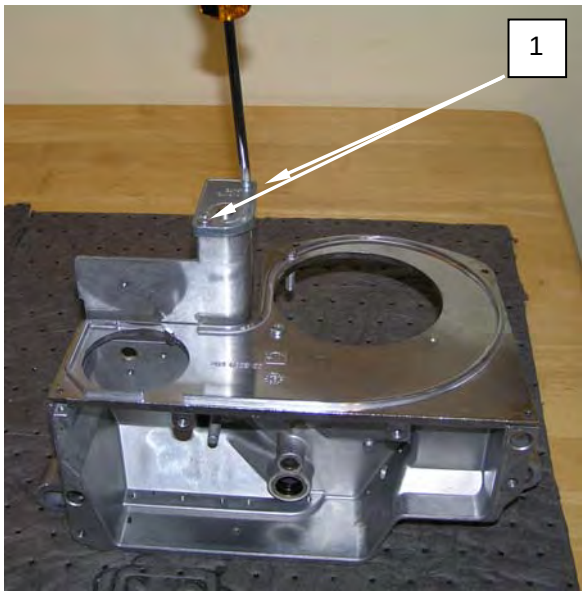


Figure 34. Flow Control Module Cover Replacement.

18. Install blower-regulating scroll into upper fan housing (Figure 35, Item 1), including both O-rings.

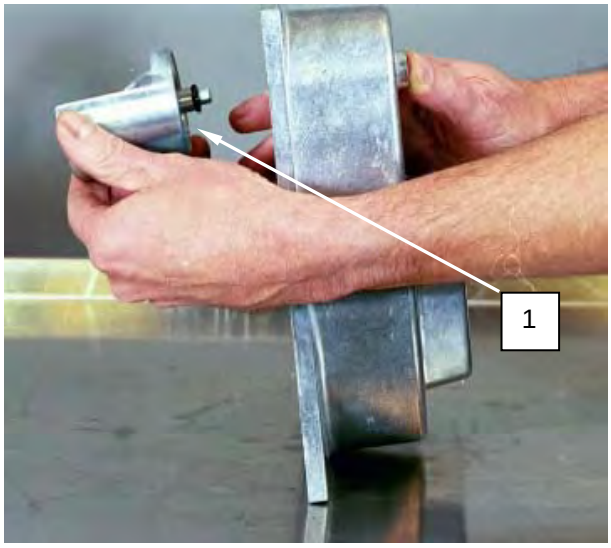


Figure 35. Blower Regulating Scroll Replacement.

REPAIR – CONTINUED

19. Install blower control knob printed index (Figure 36, Item 1) by aligning tab on index with tab on upper fan housing.

20. Install blower control knob (Figure 36, Item 2) by aligning flat side of control knob with flat side of blower-regulating scroll knob.

21. Tighten the blower control knob retaining screw (Figure 36, Item 3). Do not over tighten.

22. Place intermediate motor mounting plate (Figure 36, Item 4) back on upper fan housing (Figure 36, Item 5).

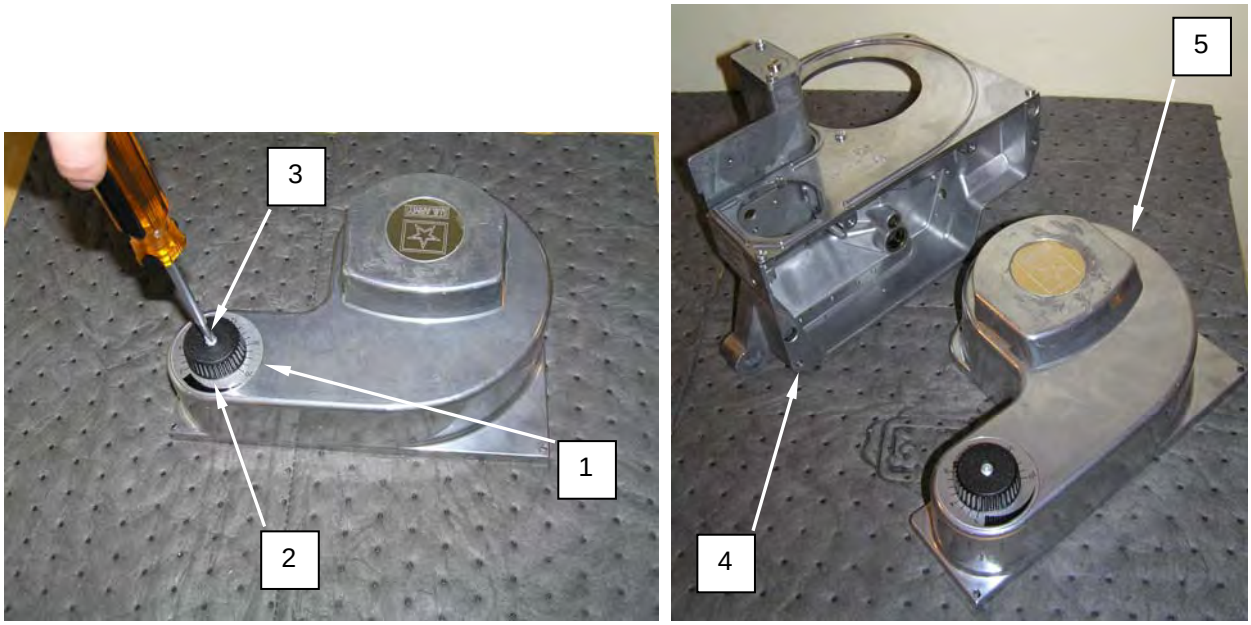


Figure 36. Upper Fan Housing and Blower Control Knob Replacement.

23. Attach upper fan housing to the intermediate motor mounting plate with two short screws (Figure 37, Item 1) and two long screws (Figure 37, Item 2).

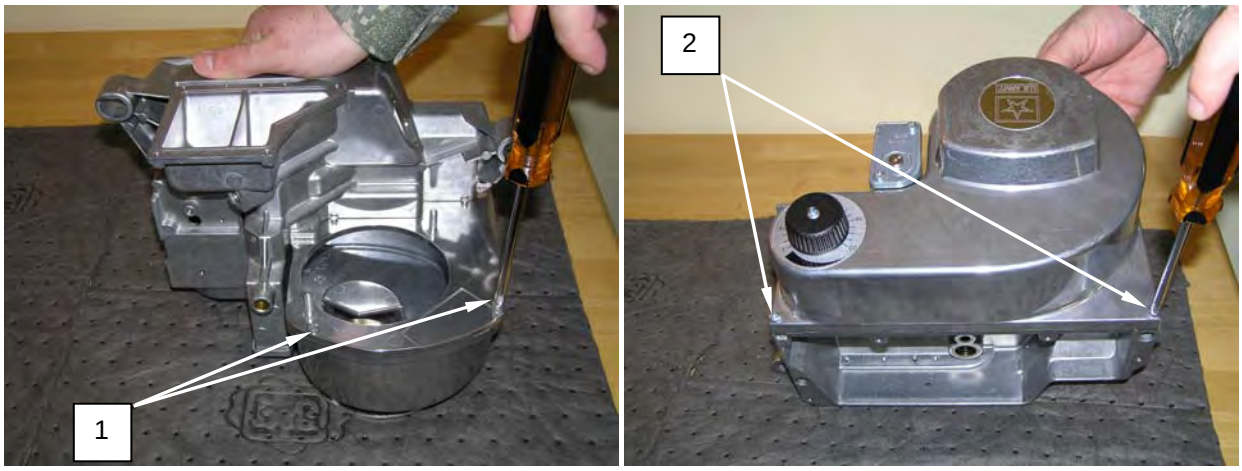


Figure 37. Upper Fan Housing Replacement.

REPAIR – CONTINUED

24. Install power cable (Figure 38, Item 1) and ground wire (Figure 38, Item 2) into lower fan housing. Install the ground wire to the lower fan housing and secure with ground wire retaining screw (Figure 38, Item 3).

25. Install ignition transformer (Figure 38, Item 4) into lower fan housing.

26. Tighten ignition transformer retaining screws (Figure 38, Item 5 and Item 6). Do not over tighten.

27. Re-connect wire spades to the ignition transformer. Connect the yellow/green wire spade connector (Figure 38, Item 7) from the ground wire to the far left small terminal, connect the blue wire spade connector (Figure 38, Item 8) to the center terminal, and the brown wire spade connector (Figure 38, Item 9) to the remaining terminal as shown.

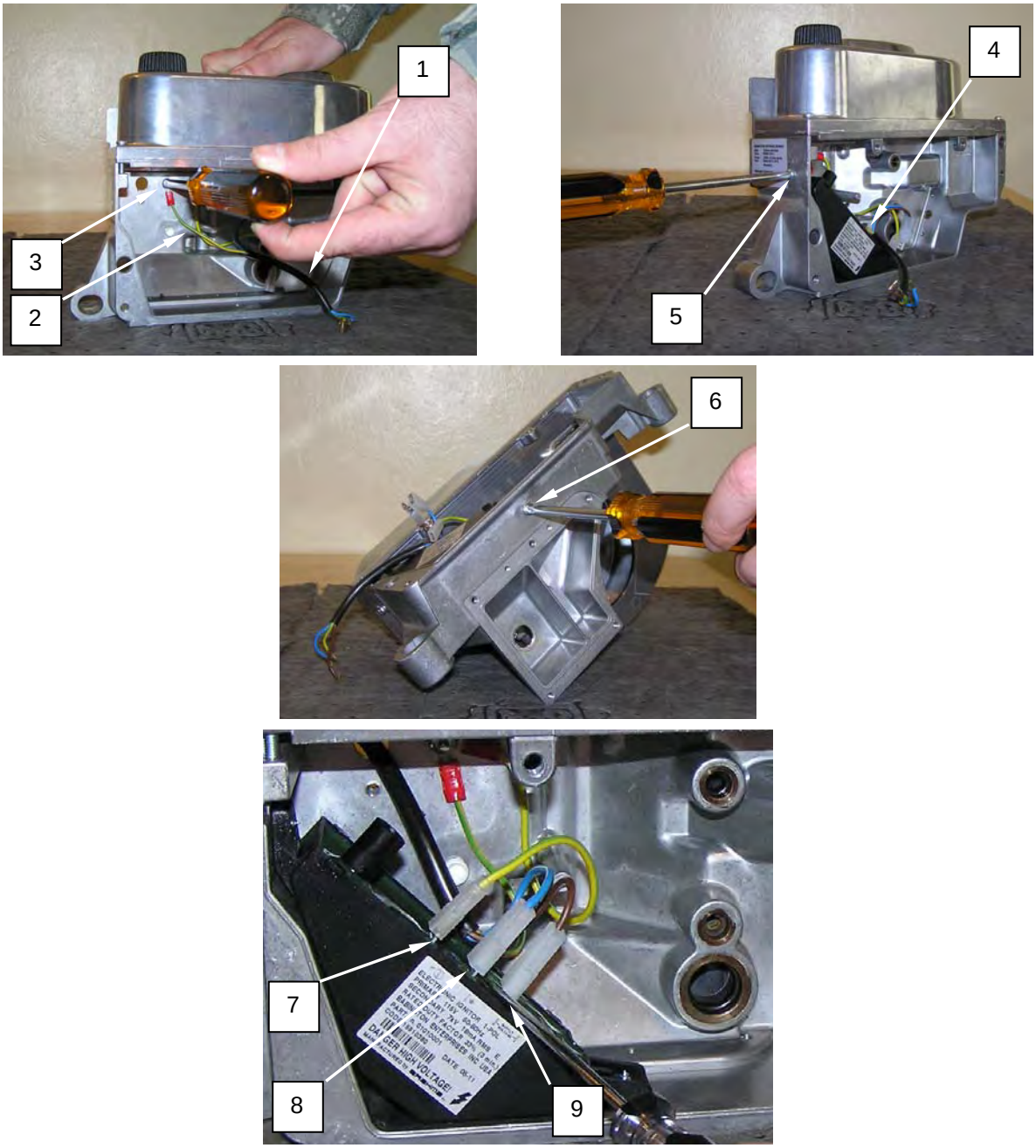


Figure 38. Spade Connection and Transformer Placement.

REPAIR – CONTINUED

28. Install overflow safety device retaining nut (Figure 39, Item 1) and tighten. Do not over tighten.
29. Route wires from overflow safety sensor (Figure 39, Item 2) through retaining nut (Figure 39, Item 1).
30. Install overflow safety sensor (Figure 39, Item 2) by hand tightening.
31. Slide overflow safety float (Figure 39, Item 3) over overflow safety sensor.
32. Install overflow safety float switch retaining clip (Figure 39, Item 4).

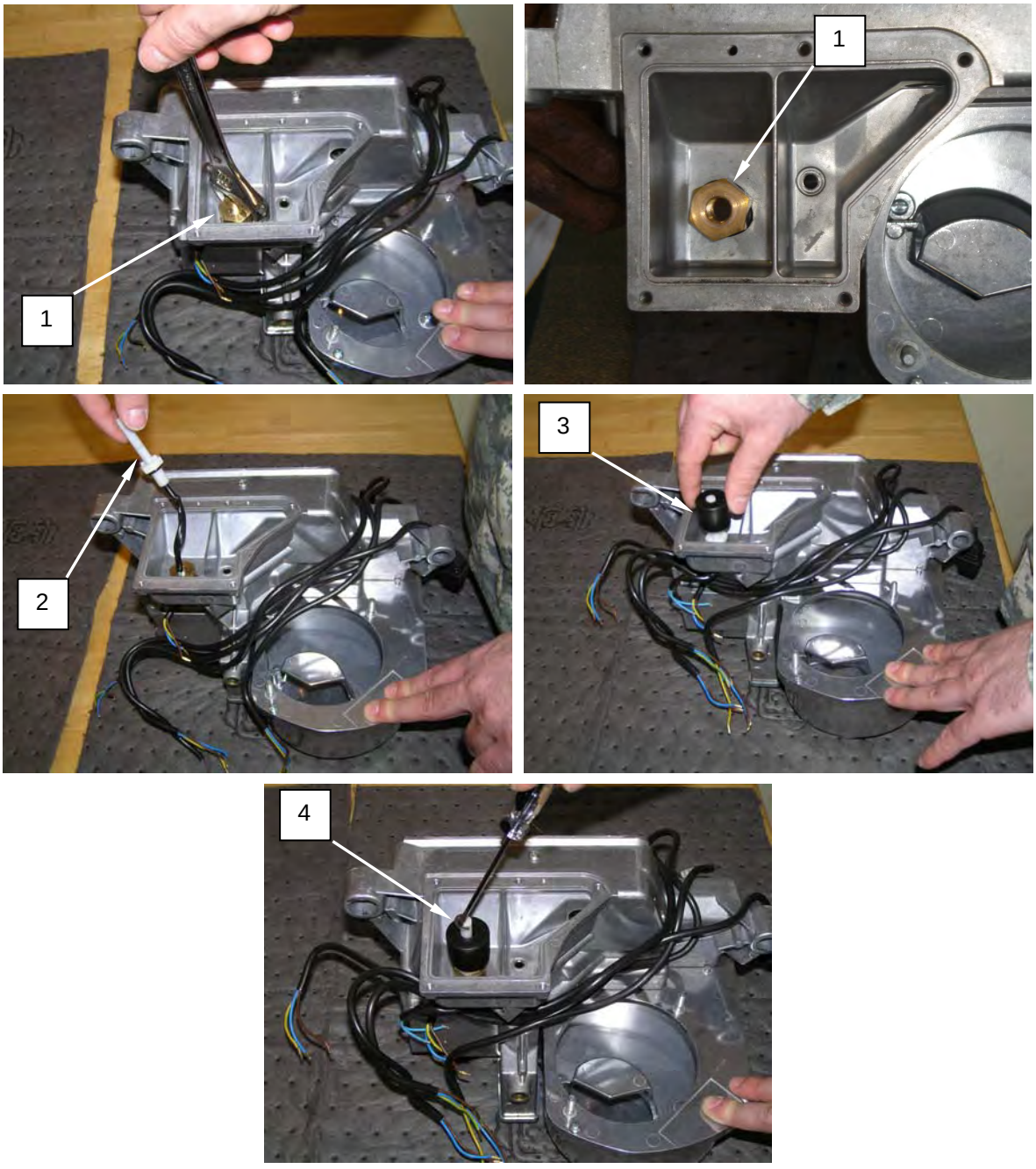


Figure 39. Overflow Safety Device Replacement.

REPAIR – CONTINUED

33. Install control box base (Figure 40, Item 1) and secure with two screws.

NOTE

The excess length of power cable is stowed between the compressor and the housing.

34. Align photocell base (Figure 40, Item 2) with holes in lower fan housing, ensuring that the slotted side faces towards the combustion chamber. Install with two screws.

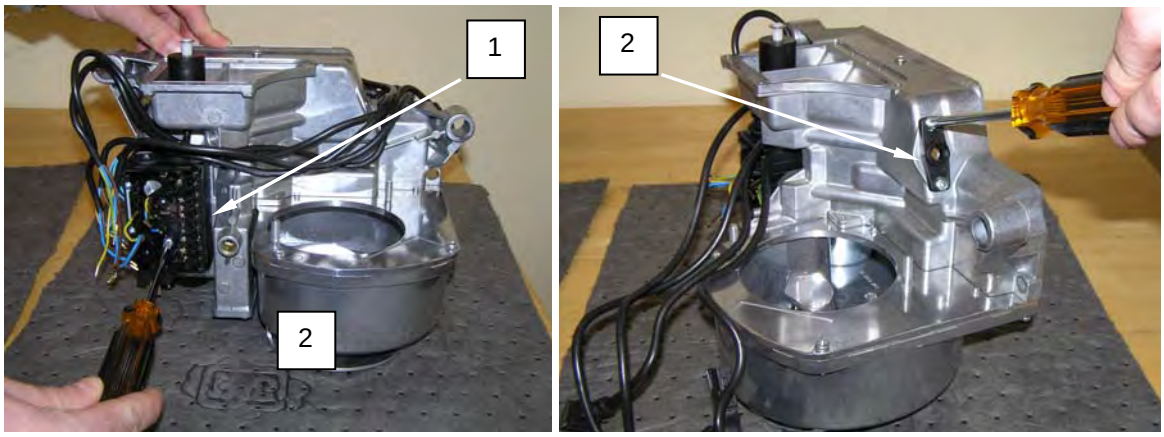


Figure 40. Photocell Base and Control Box Base Replacement.

35. Install the power pack assembly (Figure 41, Item 1), consisting of the motor, compressor, fuel pump, and blower wheel, and secure with two hex nuts and washers (Figure 41, Item 2) which hold the motor mounts to the upper fan housing.

36. Reconnect motor power cord to motor housing.

37. Plug photocell connector (Figure 41, Item 2) to photocell base, aligning the tabs on the photocell base with the tabs on the probe.

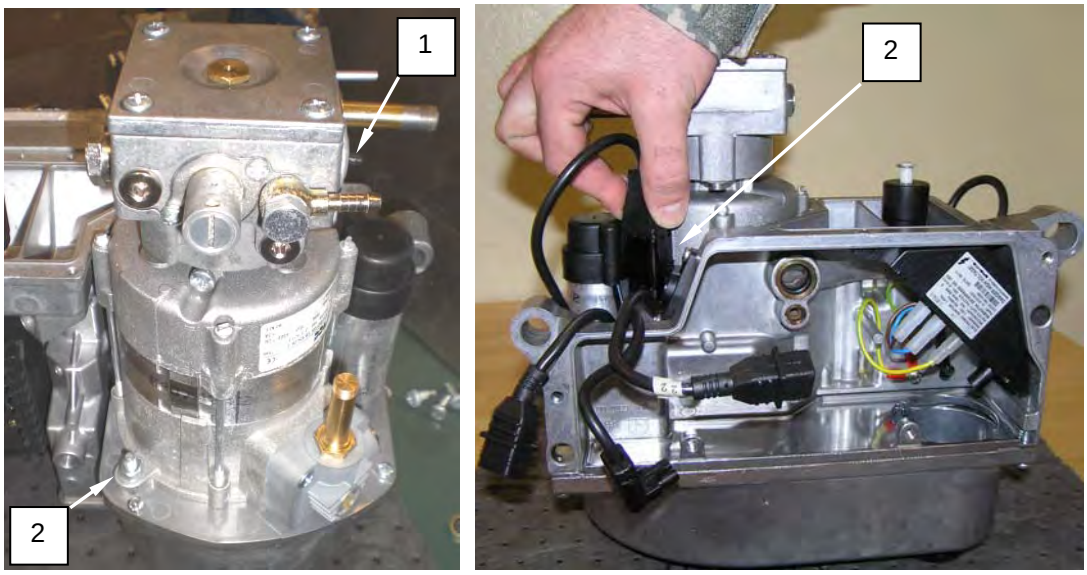


Figure 41. Photocell and Power Pack Replacement.

REPAIR – CONTINUED

NOTE

Power cables should be routed between the power pack assembly and housing.

38. Place all power cables back into the control box access hole in bottom of control box base, routing the wires behind the motor.

NOTE

The use of needle nose pliers to place wires into the terminal block will help ensure proper connection.

39. Connect the two photocell wires (brown and blue) to upper terminals (No.1 and No.2) respectively. Refer to Figure 42.

40. Connect all the ground (green/yellow) wires from main power, motor, air solenoid, and fuel solenoid to the three lower ground terminals. Refer to Figure 42.

41. Connect all the neutral (blue) wires from the main power, motor, air solenoid, fuel solenoid, and ignition transformer to the No. 8 terminals. Refer to Figure 42.

42. Connect either wire on float switch and the brown wire of fuel solenoid to lower terminal A. Refer to Figure 42.

43. Connect the brown ignition transformer wire to upper terminal No. 3. Refer to Figure 42.

44. Connect the brown motor wire and the remaining float-switch wire to upper terminal No. 4. Refer to Figure 42.

45. Connect the air solenoid brown wire to upper terminal No. 5. Refer to Figure 42.

46. Connect the main power brown wire to upper terminal No. 9. Refer to Figure 42.

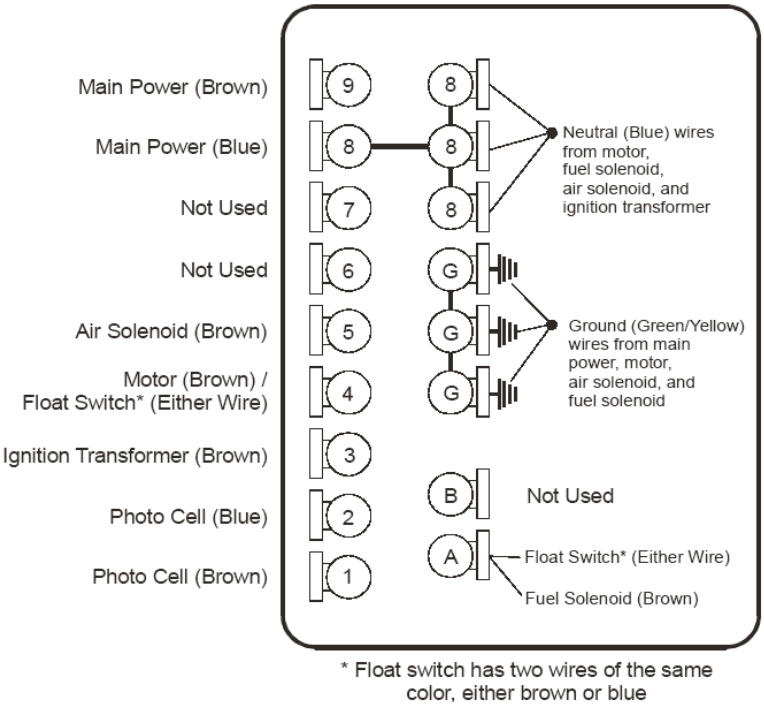


Figure 42. Burner Wiring Diagram.

REPAIR – CONTINUED

47. Place fuel solenoid post (Figure 43, Item 1) on fuel pump (Figure 43, Item 2) and secure with the retaining nut. Do not over tighten.

48. Reconnect fuel solenoid coil (Figure 43, Item 3) and fuel solenoid power cable (Figure 43, Item 4).

49. Install the fuel sump (Figure 43, Item 5) and crossover tube (Figure 43, Item 6). While gently twisting the tube, slowly slide the sump horizontally toward the pump to engage the fuel crossover tube to the sump pump taking care not to damage overflow safety device.

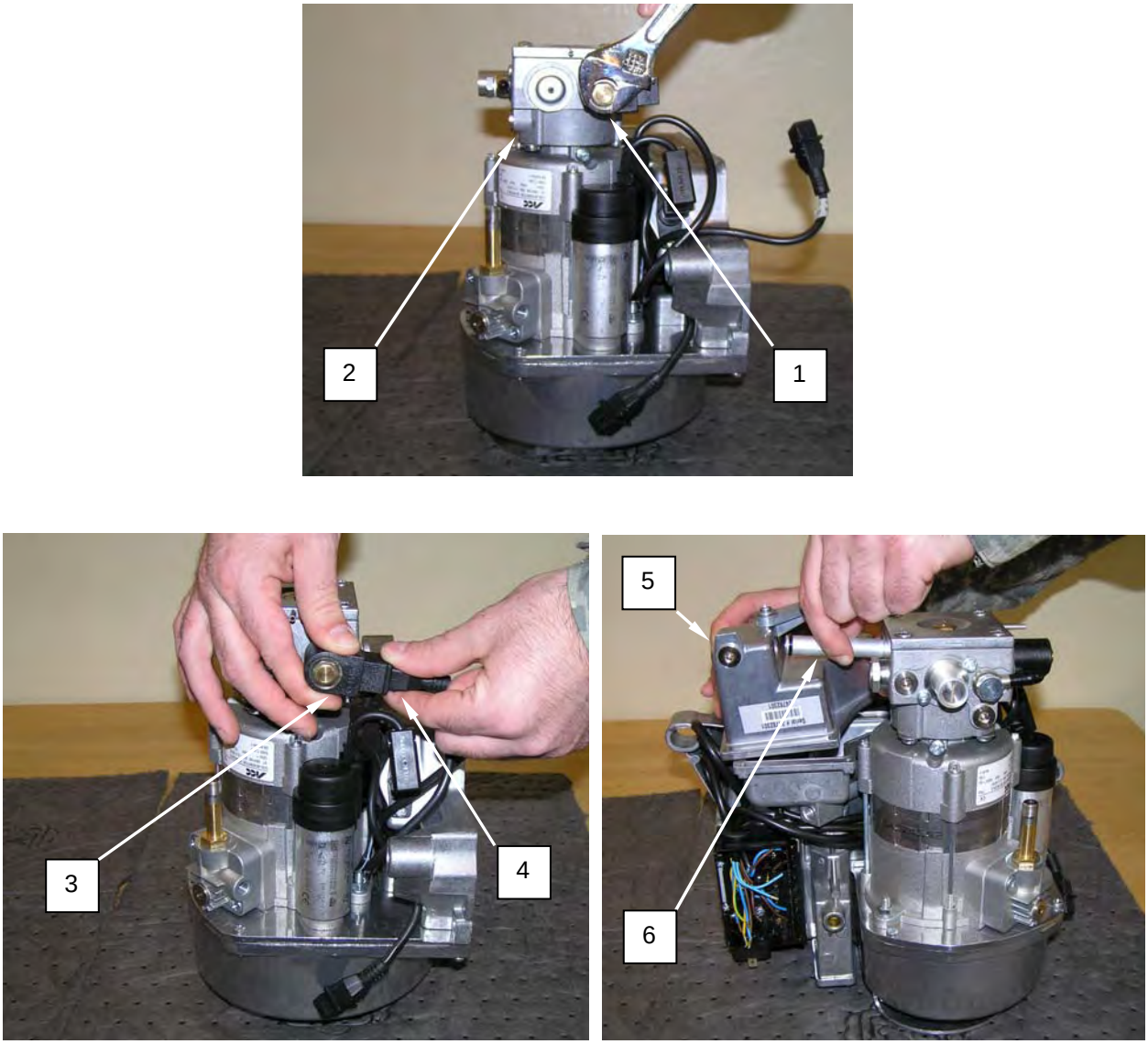


Figure 43. Fuel Sump and Fuel Solenoid Power Cable.

REPAIR – CONTINUED

50. Check the fuel sump gasket to ensure it is flexible and not torn. Install the screws that hold the fuel sump to the lower fan housing and tighten, alternating screws to ensure uniform seal (Figure 44, Item 1 and Item 2).

51. Install the metal fuel line (Figure 44, Item 3) and tighten both metal fuel line hex nut connections by hand first, then with a wrench, being careful not to cross thread the connections.

52. Install the metal air line (Figure 44, Item 4) and tighten both air line hex nut connections by hand.

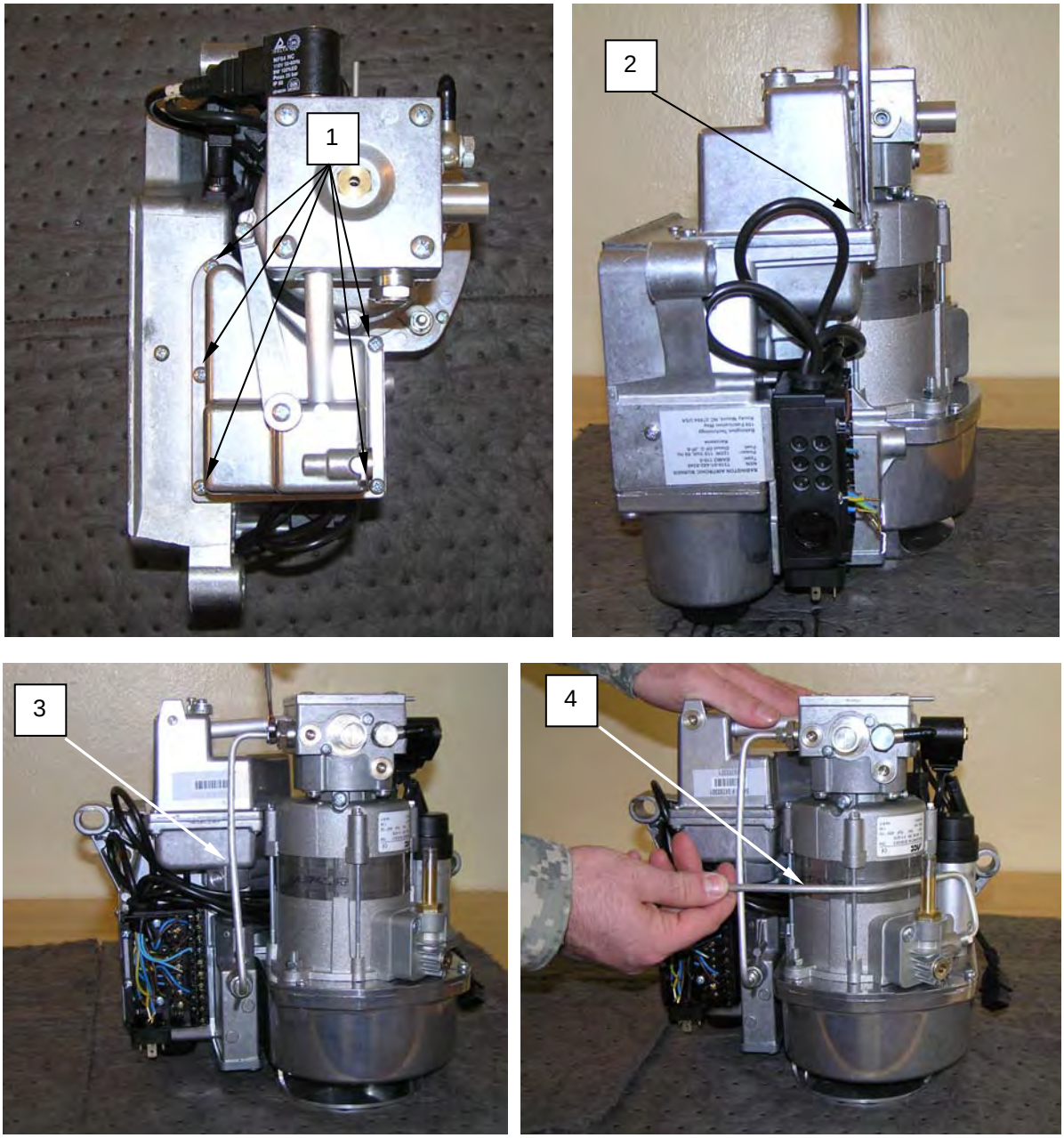


Figure 44. Air Line and Fuel Line Replacement.

REPAIR – CONTINUED

53. Use a wrench to tighten the metal air line connections (Figure 45, Item 1), being careful not to cross thread the connections. Do not over tighten.

54. Plug air solenoid coil (Figure 45, Item 2) into power cable (Figure 45, Item 3).

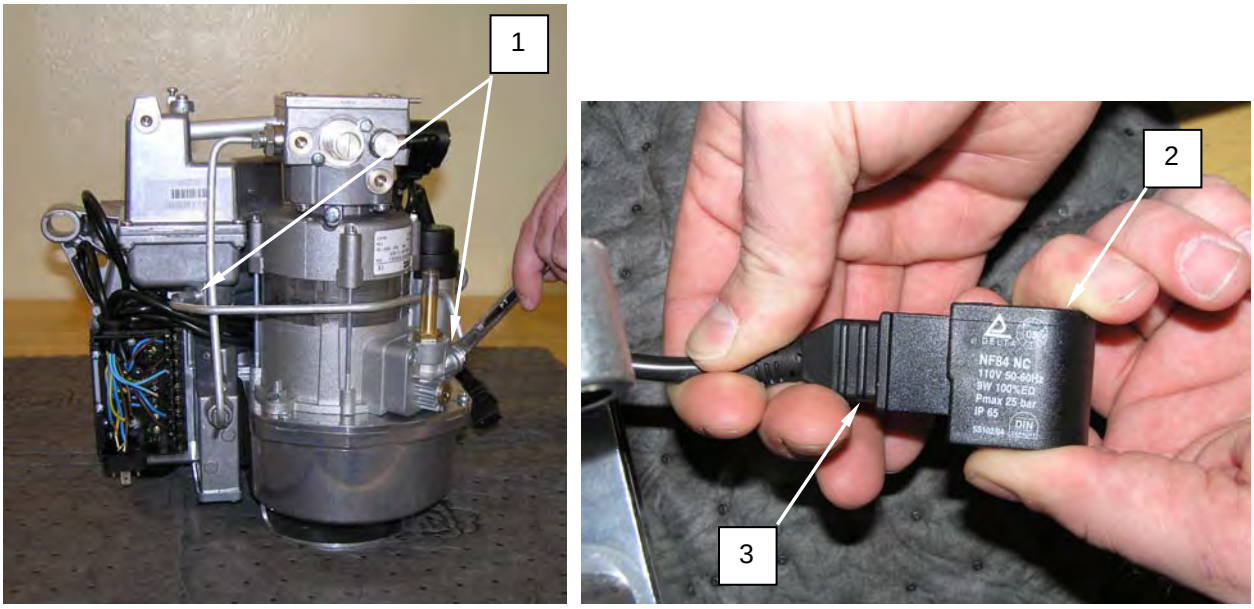


Figure 45. Air Solenoid Coil and Air Line Replacement.

55. Install air solenoid coil (Figure 46, Item 1) onto valve body, and install washers over air solenoid coil (Figure 46, Item 2).

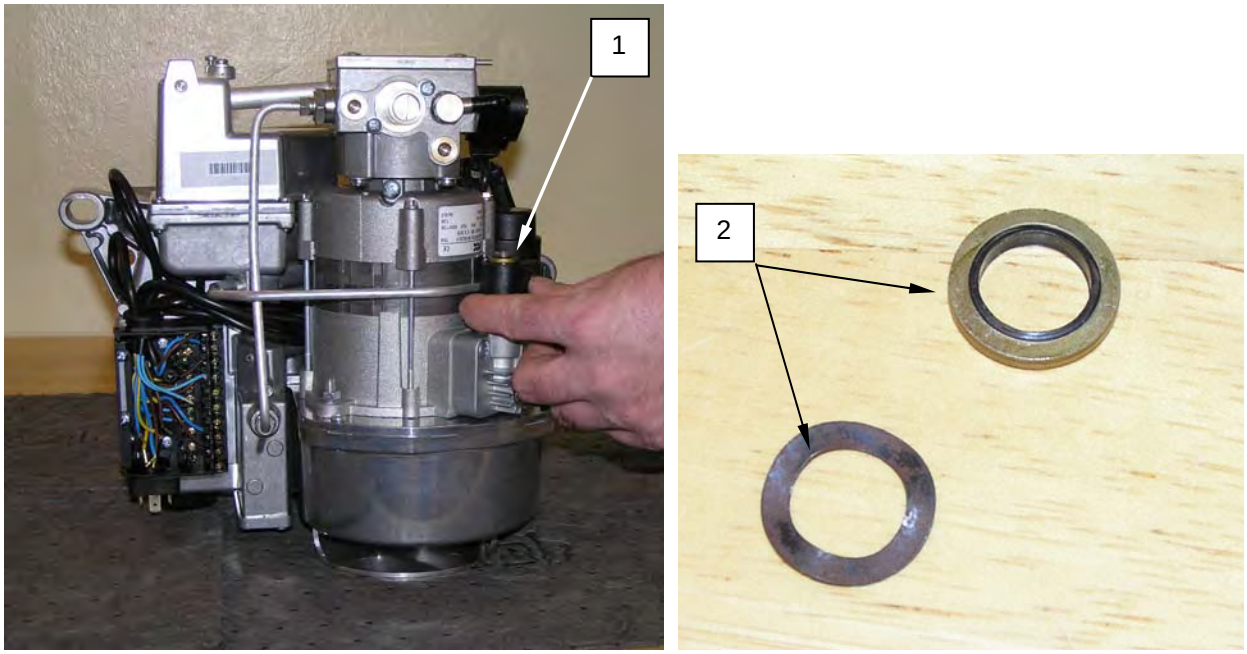


Figure 46. Air Solenoid Coil and Air Solenoid Replacement.

REPAIR – CONTINUED

56. Install primer port coupling (Figure 47, Item 1) onto the base of the air solenoid and finger tighten.

57. Re-connect primer port tubing to the base of the fuel pump (Figure 47, Item 2).

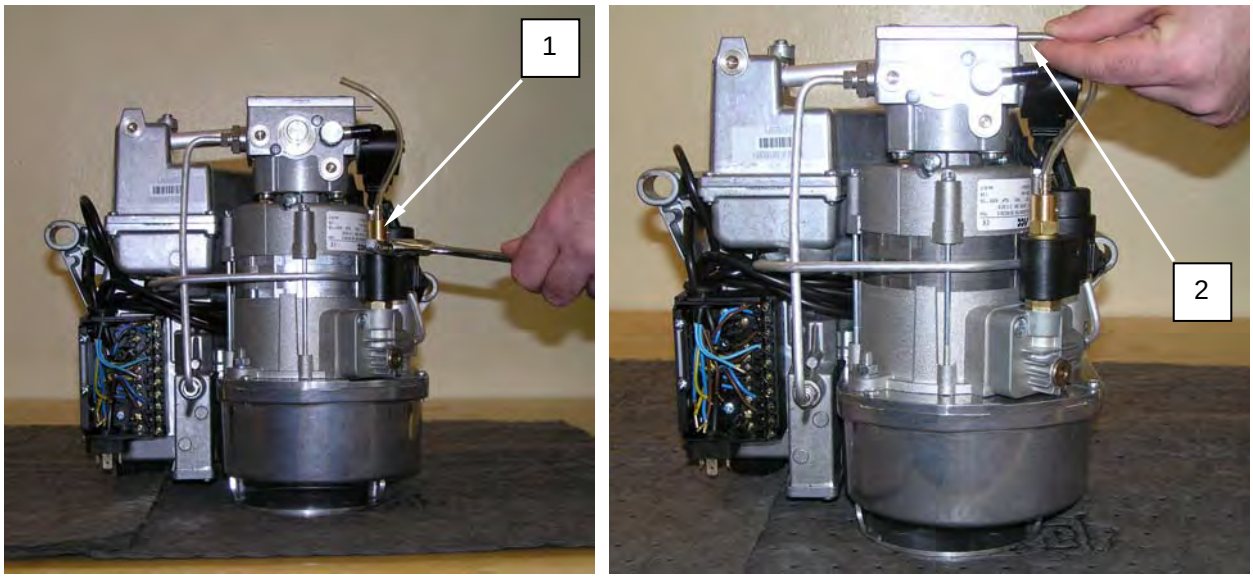


Figure 47. Primer Port Tubing and Primer Port "T" Replacement.

58. Re-connect the igniter cable spade connector from the atomizing chamber to the ignition transformer (Figure 48, Item 1). Removal and installation of the atomizing chamber does not require tools. Install the atomizing chamber (Figure 48, Item 2) by inserting the tubing into the appropriate slots by hand.

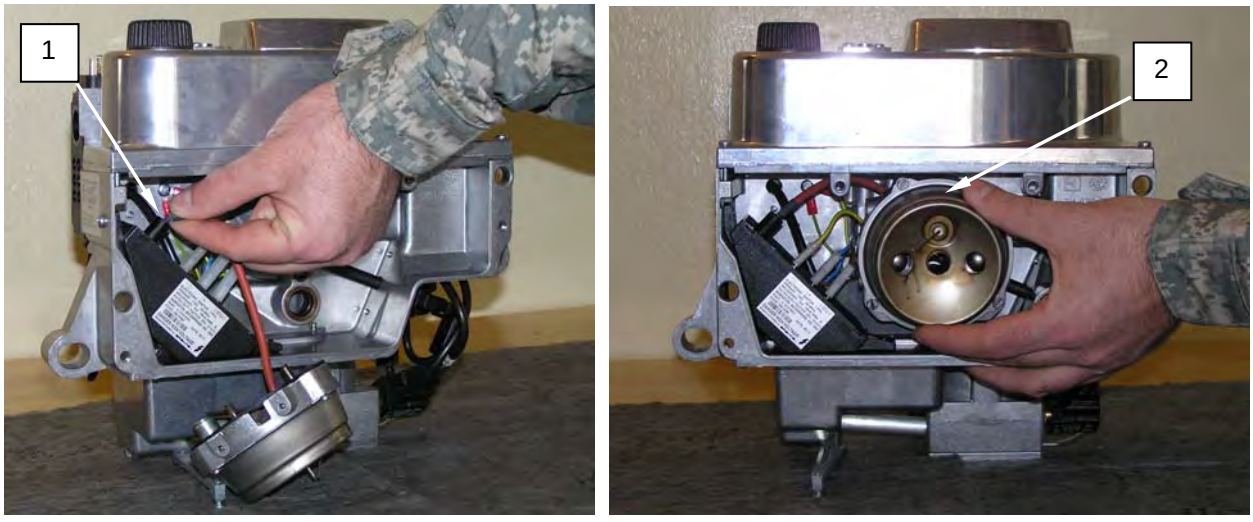


Figure 48. Atomizing Chamber Replacement.

REPAIR – CONTINUED

CAUTION

Stand the TRH burner unit on the fuel pump side to prevent damage to the metal fuel line. Failure to do so could cause damage to the equipment.

59. Install the front flange (Figure 49, Item 1) of the lower fan housing by replacing and tighten the four flange retaining screws (Figure 49, Item 2) to cover the atomizing chamber (Figure 49, Item 3). If the air tube/flame tube assembly (Figure 49, Item 4) was removed, install it prior to placing front flange back on the lower housing.

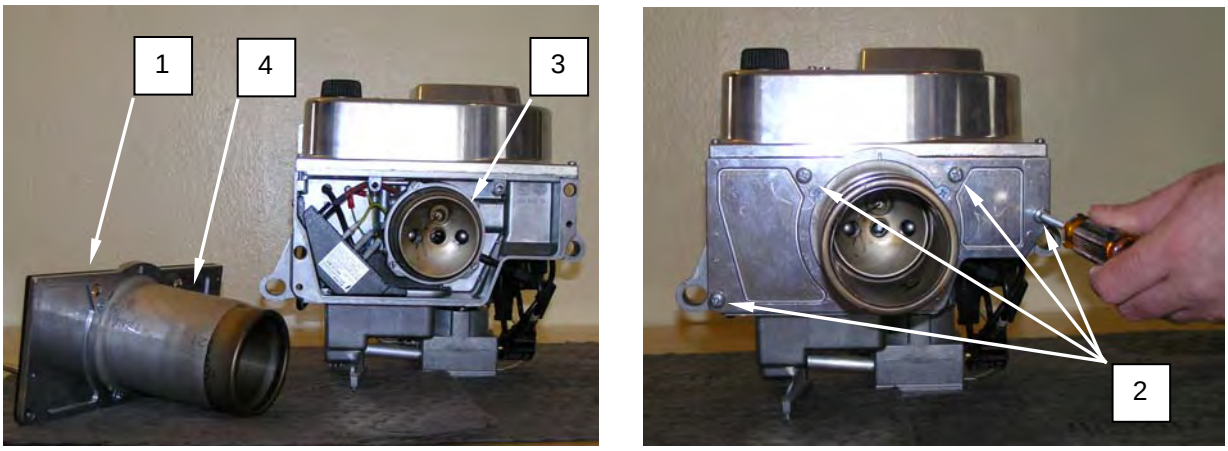


Figure 49. Lower Fan Housing Flange Replacement.

60. Install the control box and tighten the retaining screw (Figure 50, item 1). Do not over tighten.

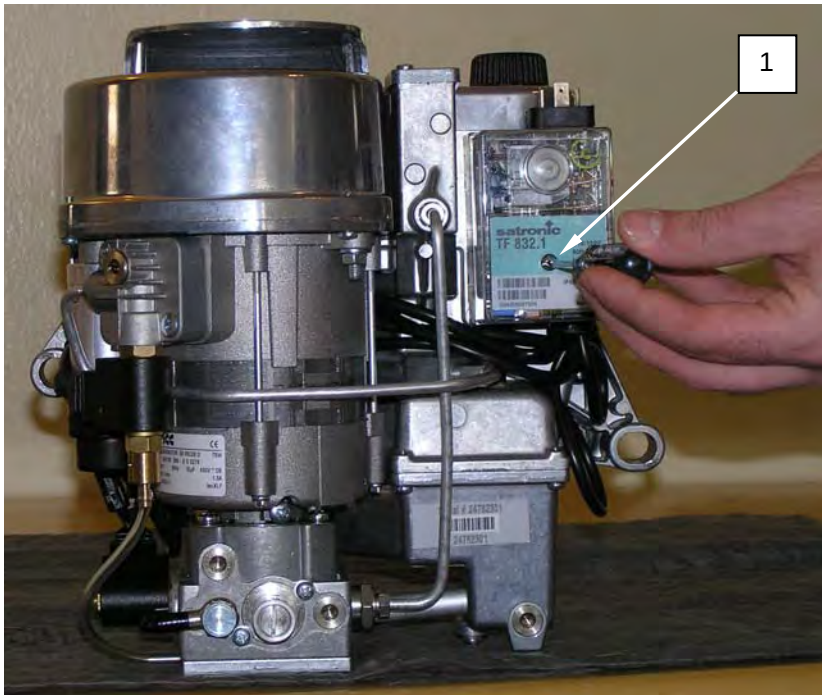


Figure 50. TRH Burner Control Box Replacement.

END OF TASK

END OF WORK PACKAGE

SERVICE MAINTENANCE

INTAKE AIR FILTER ELEMENT REPLACE

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit: Automotive (GMTK) (WP 0066, Item 4)

Personnel Required

Food Service Operator 92G (1) or
Food Service Technician 3381 (1)

Materials/Parts

Oil and Water Absorbent Material (WP 0065, Item 1)

Equipment Condition

Burner removed from TRH tank IAW WP 0026

REPLACE

1. Unscrew and remove compressor machine thread plug (Figure 1, Item 1).

Figure 1. Remove Filter Plug.

REPLACE - CONTINUED

2. Using long nose pliers, remove the compressor intake air filter element (Figure 2, Item 1) and discard.

3. Using long nose pliers, install new filter (Figure 2, Item 1).

Figure 2. Remove Intake Air Filter Element.

4. Install machine thread plug (Figure 3, Item 1) and tighten.

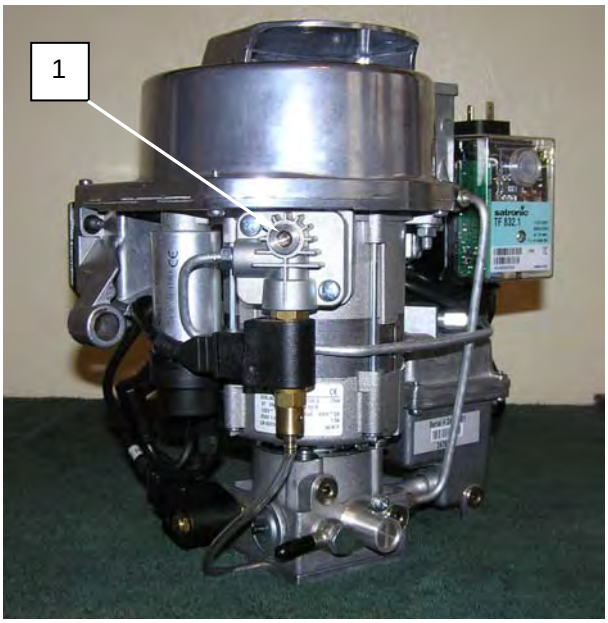


Figure 3. Replace Filter Plug.

END OF TASK

END OF WORK PACKAGE

SERVICE MAINTENANCE

FUEL PUMP
REPAIR, REPLACE

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit: Automotive (GMTK)
(WP 0066, Item 4)

Personnel Required

Quartermaster Equipment Repairer 63J (1)
Food Service Technician 3381 (1)

Materials/Parts

Oil and Water Absorbent Material
(WP 0065, Item 1)
Chemical and Oil Protective Gloves,
(WP 0065, Item 9)
Industrial Goggles (WP 0065, Item 10)

Equipment Condition

TRH Burner removed from TRH (WP 0026)

REPAIR

Fuel Pump Membrane Replacement

WARNING

Do not attempt service procedures on a TRH burner that has recently been in operation. Let the burner cool down before performing these procedures. Failure to observe safety precautions may result in severe personal injury.

1. Remove four retaining screws (Figure 1, Item 1) from fuel pump cover (Figure 1, Item 2).

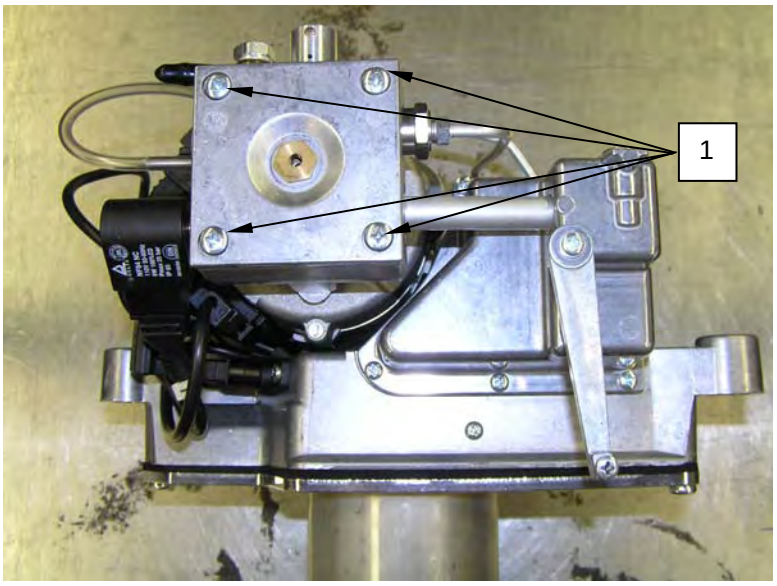


Figure 1. Fuel Pump Retaining Screws.

REPAIR - CONTINUED

WARNING

Be mindful of residual fuel when performing service on a TRH Burner. Fuel can be absorbed in the skin or clothing and present a combustion hazard. Be sure to use absorbent material to clean up any excess fuel. Wear protective clothing when servicing a TRH Burner. Wash hands and clothes thoroughly after service. Failure to observe these warnings may result in injury to personnel.

2. Remove pump membrane (Figure 2, Item 1) from fuel pump being careful not to misplace small spring (Figure 2, Item 2).

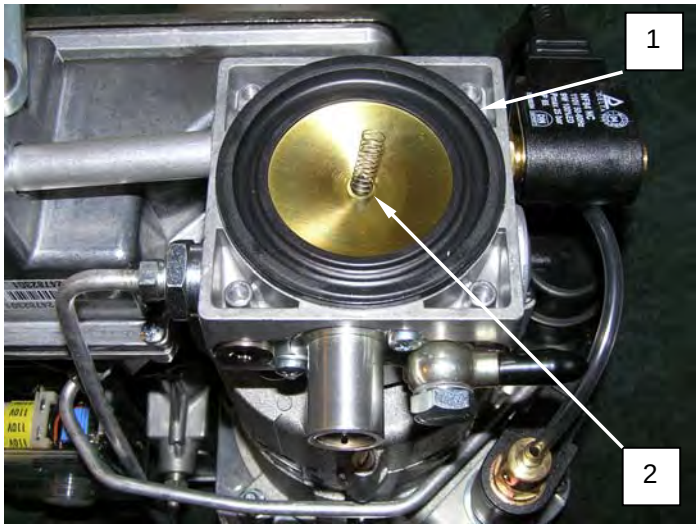


Figure 2. Fuel Pump Membrane and Spring.

3. Remove metal disk (Figure 3, Item 1) from pump membrane (Figure 3, Item 2), and dispose of disk IAW Unit SOP if damaged.

4. Place metal disk in replacement pump membrane by stretching membrane over disk.

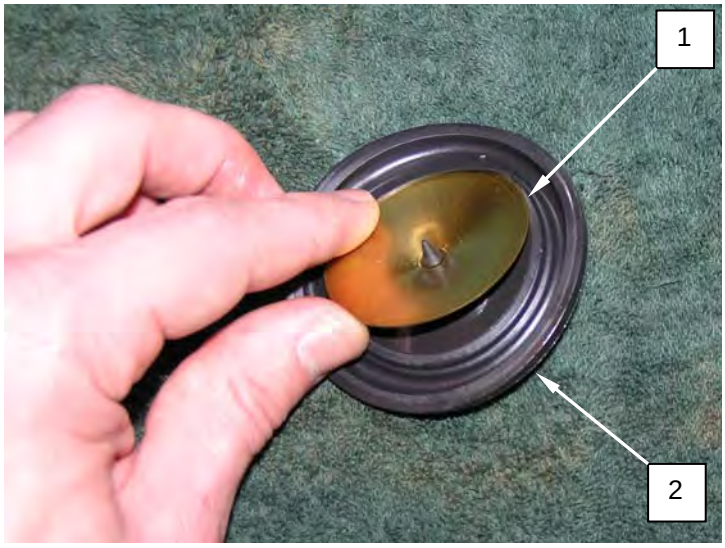


Figure 3. Fuel Pump Membrane and Disk.

REPAIR – CONTINUED

5. Install replacement fuel pump membrane (Figure 4, Item 1) and spring (Figure 4, Item 2) in fuel pump housing.

Figure 4. Fuel Pump Membrane and Spring.

6. Install fuel pump cover (Figure 5, Item 1) and retaining screws (Figure 5, Item 2).

7. Tighten retaining screws.

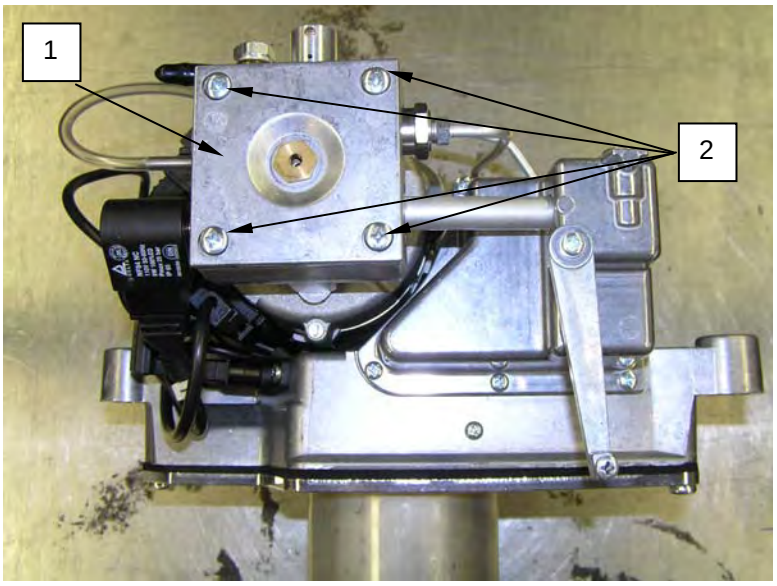


Figure 5. Fuel Pump Cover.

END OF TASK

REPLACE

1. Remove five fuel sump retaining screws (Figure 6, Item 1 and Item 2).

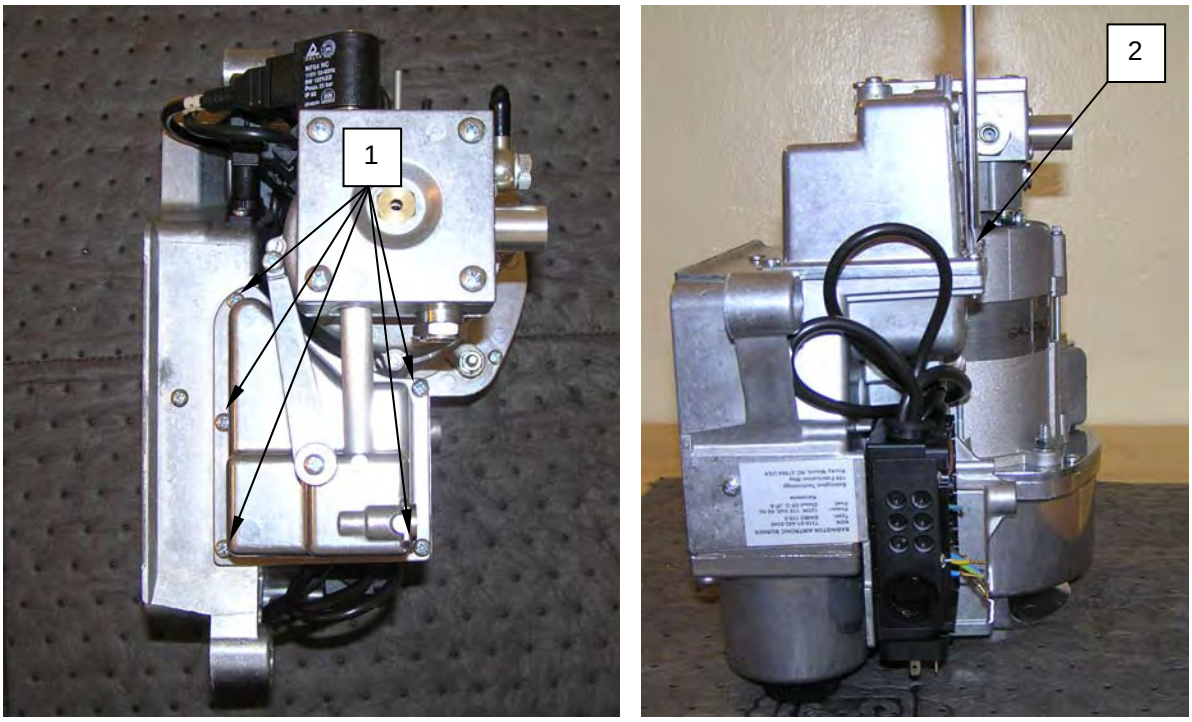


Figure 6. Removing the Fuel Sump.

2. While gently rotating connector tube, slowly slide sump (Figure 7, Item 1) horizontally away from the pump to disengage the fuel crossover tube (Figure 7, Item 2) from the fuel pump (Figure 7, Item 3), taking care not to damage the overflow safety device. Remove the fuel sump (Figure 7, Item 1) and crossover tube (Figure 7, Item 2).

3. Remove fuel solenoid coil retaining nut and washer (Figure 7, Item 4), and fuel solenoid coil (Figure 7, Item 5) from pump.

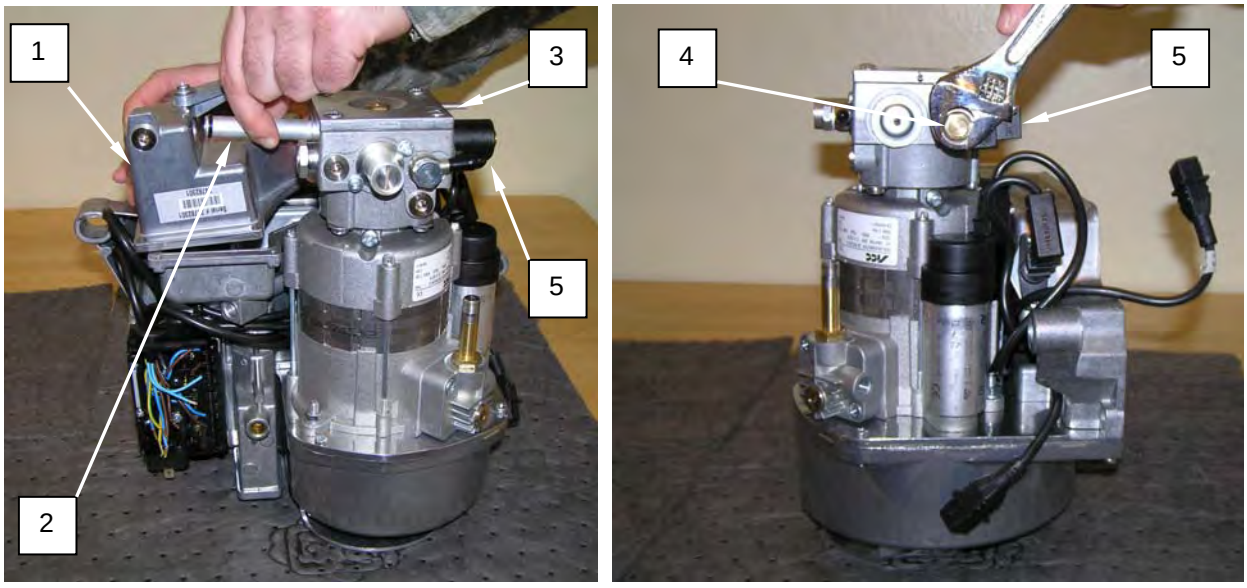


Figure 7. Crossover Tube, Sump, and Solenoid Removal.

REPLACE - CONTINUED

4. Remove primer port tube (Figure 8, Item 1).

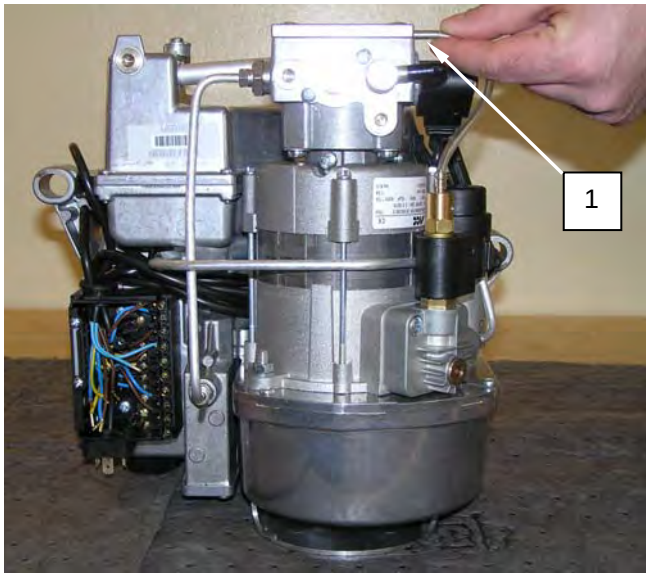


Figure 8. Primer Port Tubing Removal.

5. Detach metal tube assembly from fuel pump by loosening retaining nut (Figure 9, Item 1) on fuel pump.

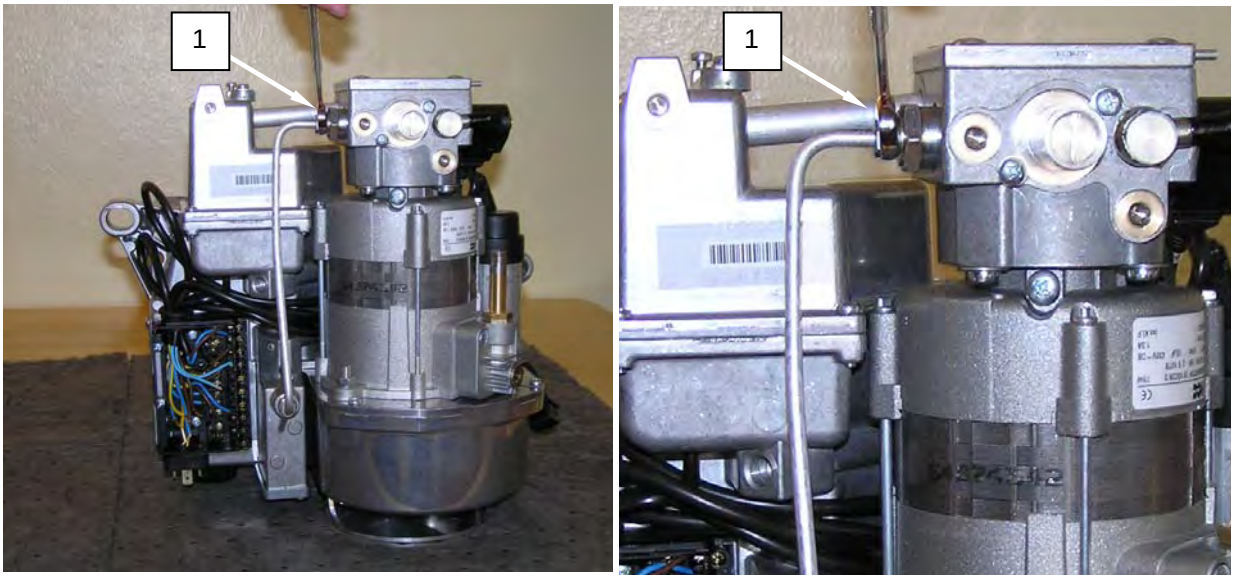


Figure 9. Metal Tube Assembly Removal.

REPLACE - CONTINUED

6. Loosen two retaining screws that secure the pump assembly (Figure 10, Item 1).

7. Lift out pump assembly (Figure 10, Item 2).

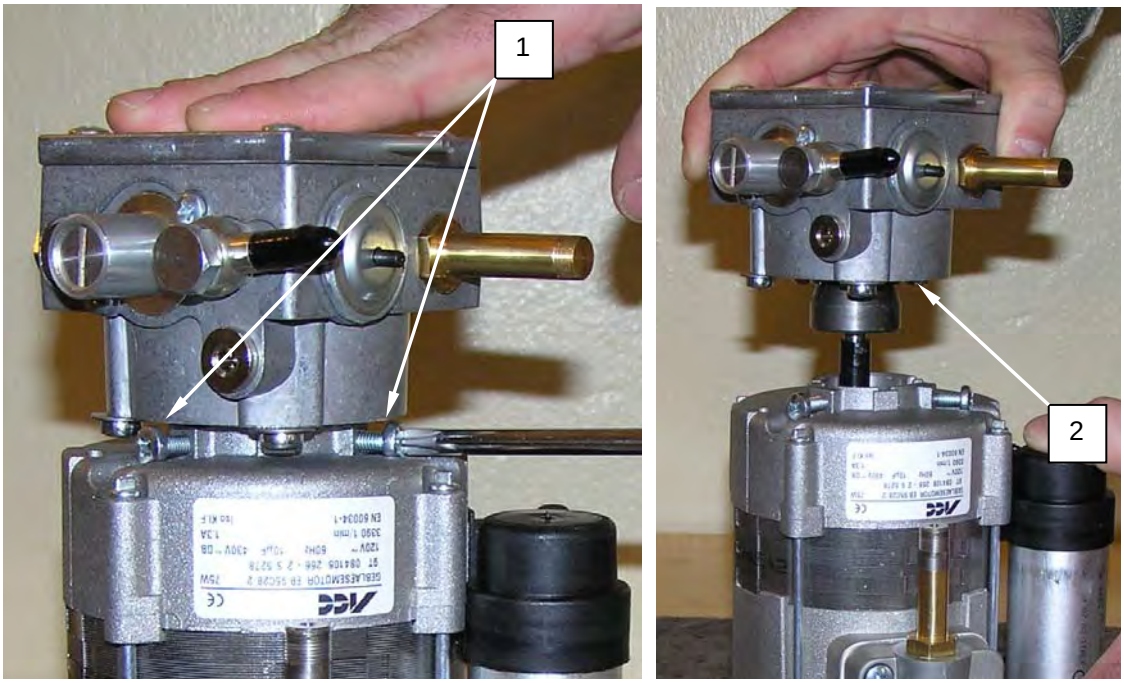


Figure 10. Fuel Pump Assembly Removal.

8. Replace fuel pump with serviceable item from stock. Ensure coupling (Figure 11, Item 1) is present on replacement pump.

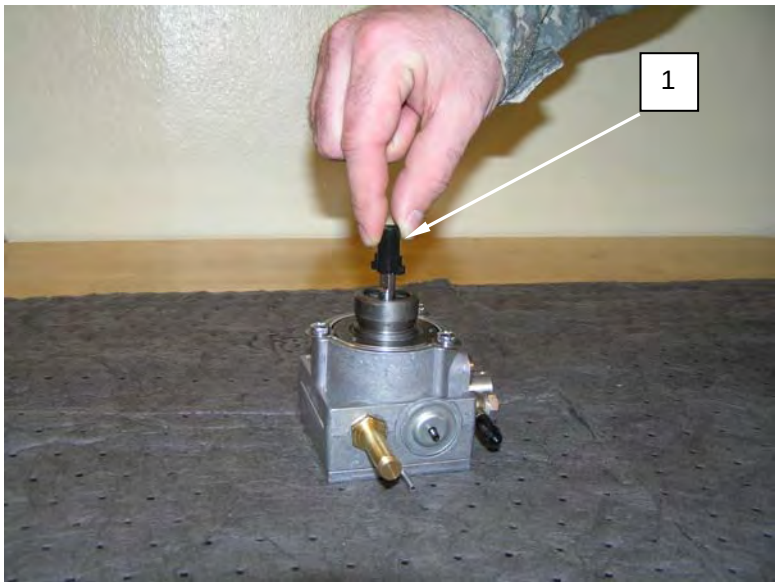


Figure 11. Fuel Pump Coupling.

REPLACE - CONTINUED

9. Install fuel pump assembly (Figure 12, Item 1). Orient so fuel primer port (Figure 12, Item 2) is aligned with fuel line.

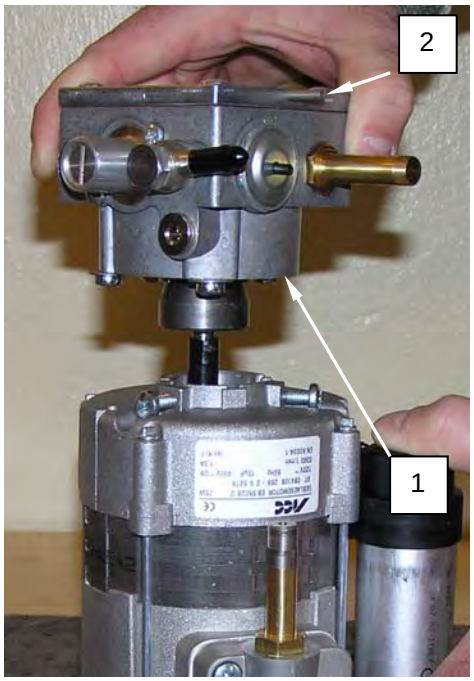


Figure 12. Fuel Pump Assembly Removal.

10. Install metal tube assembly and tighten retaining nut (Figure 13, Item 1).

Figure 13. Metal Tube Assembly Removal.

REPLACE - CONTINUED

11. Install the fuel sump (Figure 14, Item 1) and crossover tube (Figure 14, Item 2). While gently twisting the crossover tube, slowly slide the sump horizontally toward the pump (Figure 14, Item 3) to engage the fuel crossover tube to the sump pump taking care not to damage overflow safety device.

12. Tighten five fuel sump retaining screws (Figure 14, Item 1 and Item 2).

13. Place fuel solenoid coil (Figure 14, Item 4) on fuel pump and secure by both replacing and tightening the retaining nut (Figure 14, Item 5).

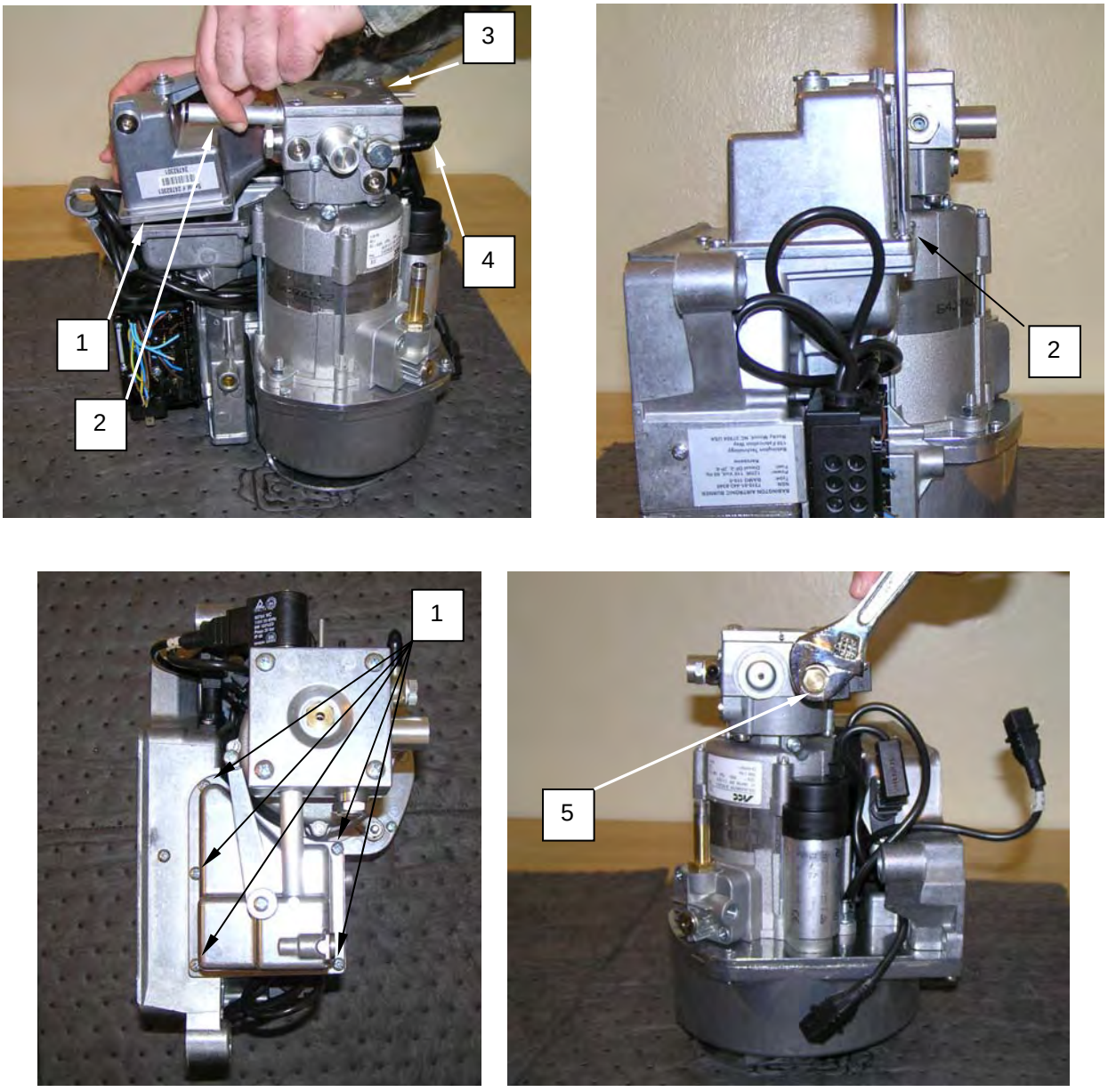


Figure 14. Crossover Tube, Sump, and Solenoid Replacement.

REPLACE - CONTINUED

14. Install primer port tubing (Figure 15, Item 1).

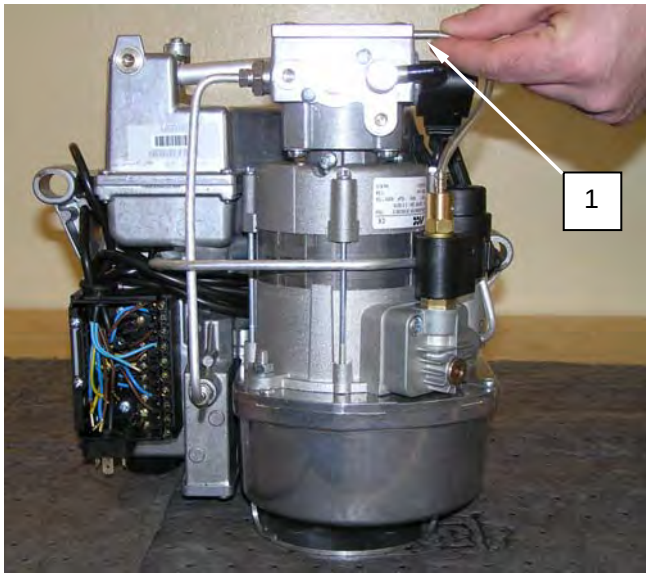


Figure 15. Primer Port Tube Replacement.

NOTE

Ensure that the crossover tube is properly aligned prior to tightening screws.

15. Tighten fuel pump assembly retaining screws (Figure 16, Item 1).

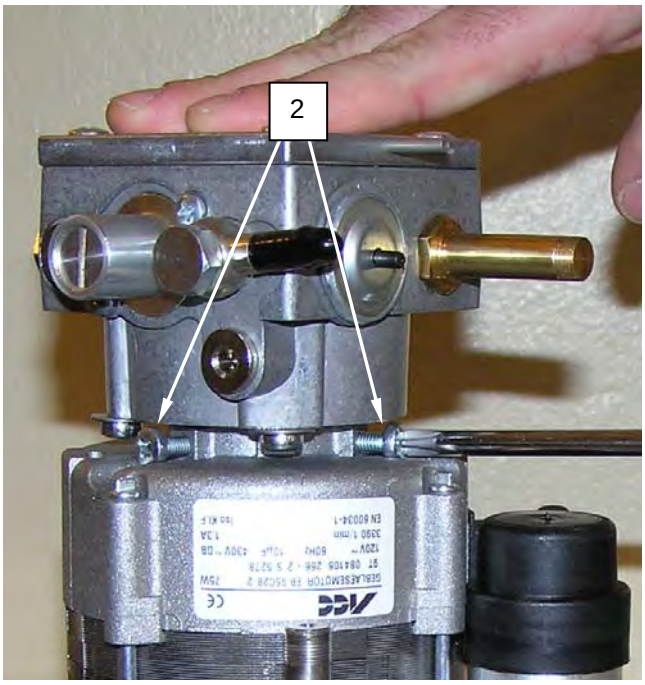


Figure 16. Tighten Fuel Pump Assembly Retaining Screws.

END OF TASK

END OF WORK PACKAGE

SERVICE MAINTENANCE

ATOMIZING CHAMBER
REPAIR, REPLACE

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit: Automotive (GMTK)
(WP 0066, Item 4)

Personnel Required

Quartermaster Equipment Repairer 63J (1)
Food Service Technician 3381 (1)

Materials/Parts

Oil and Water Absorbent Material
(WP 0065, Item 1)
Chemical and Oil Protective Gloves
(WP 0065, Item 9)
Industrial Goggles (WP 0065, Item 10)

Equipment Condition

TRH Burner removed from TRH (WP 0026)

REPAIR

Repair of the atomizing chamber will consist of replacing the Igniter.

1. Remove the front flange of the lower fan housing by removing the four screws (Figure 1, Item 1) to expose the atomizing chamber (Figure 1, Item 2). It is not necessary to remove the air tube/flame tube assembly (Figure 1, Item 3) from the front flange (Figure 1, Item 4).

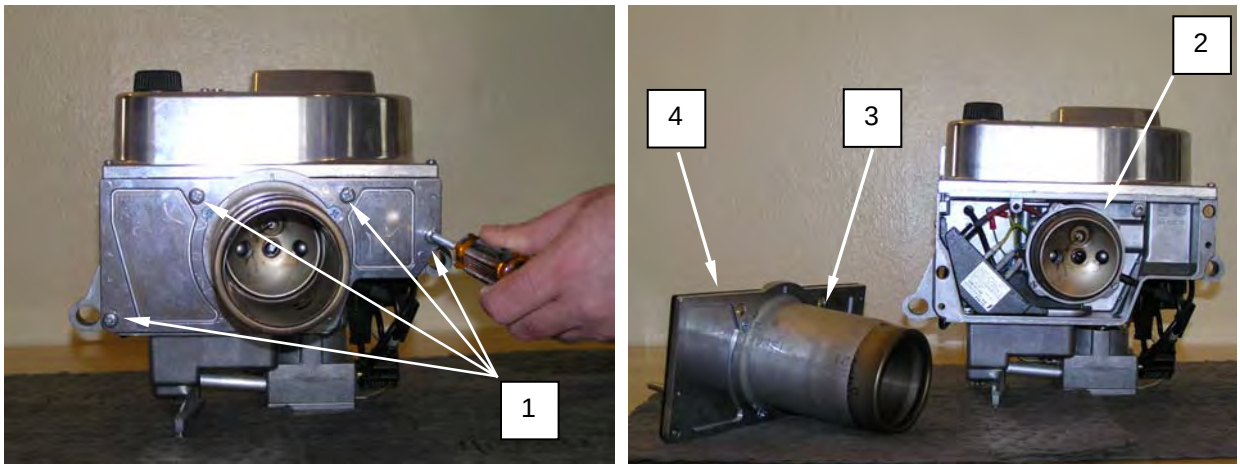


Figure 1. Lower Fan Housing Flange Removal.

REPAIR – CONTINUED

2. Remove the atomizing chamber by pulling directly out (Figure 2, Item 1). Once removed, pull the igniter cable spade connector from the ignition transformer (Figure 2, Item 2).

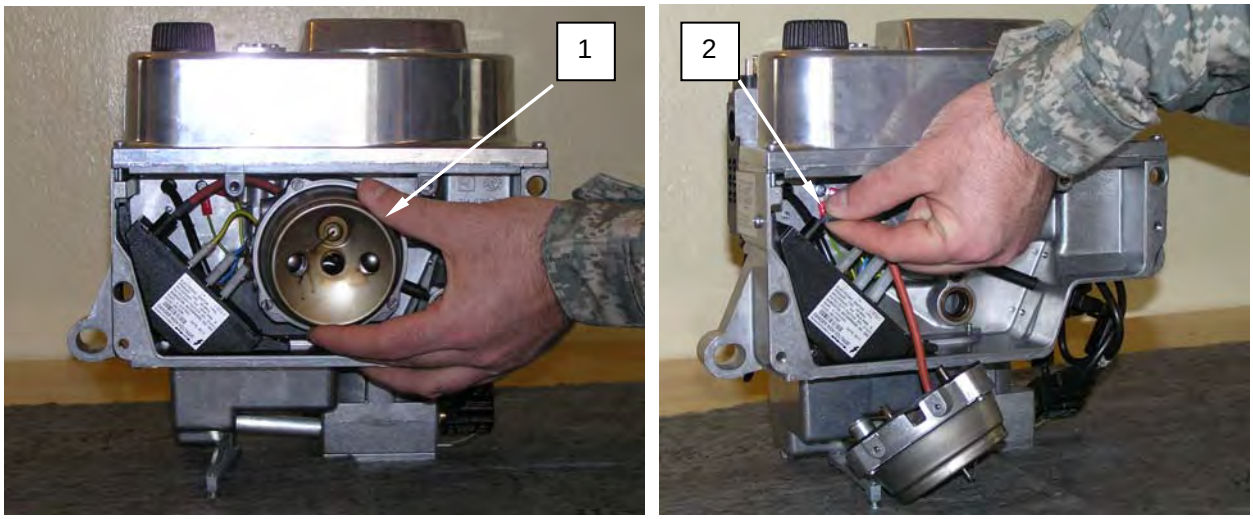


Figure 2. Atomizing Chamber Removal.

3. Loosen the igniter retaining screw to remove and replace the igniter (Figure 3, Item 1).

4. Slide the igniter (Figure 3, Item 2) out of the front of the atomizing chamber and replace the new igniter back through the front of the atomizing chamber.

5. Align the tip of the igniter with the igniter post and lightly tighten the igniter retaining screw (Figure 3, Item 1).

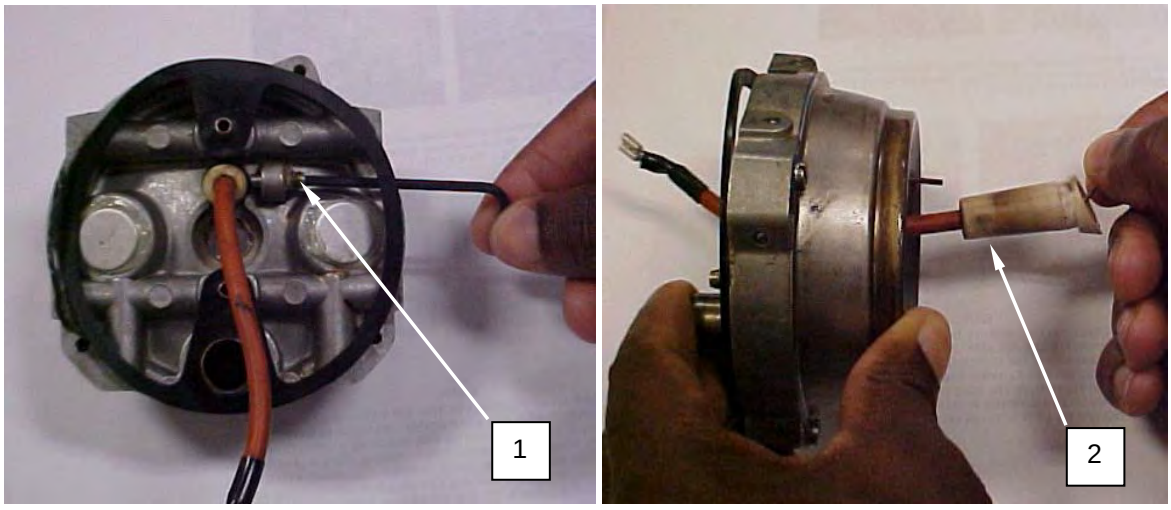


Figure 3. Igniter Replacement.

REPAIR – CONTINUED

6. Re-connect the igniter cable spade connector from the atomizing chamber to the ignition transformer (Figure 4, Item 1). Installation of the atomizing chamber does not require tools. Replace the atomizing chamber (Figure 4, Item 2) by inserting the tubing into the appropriate slots by hand.

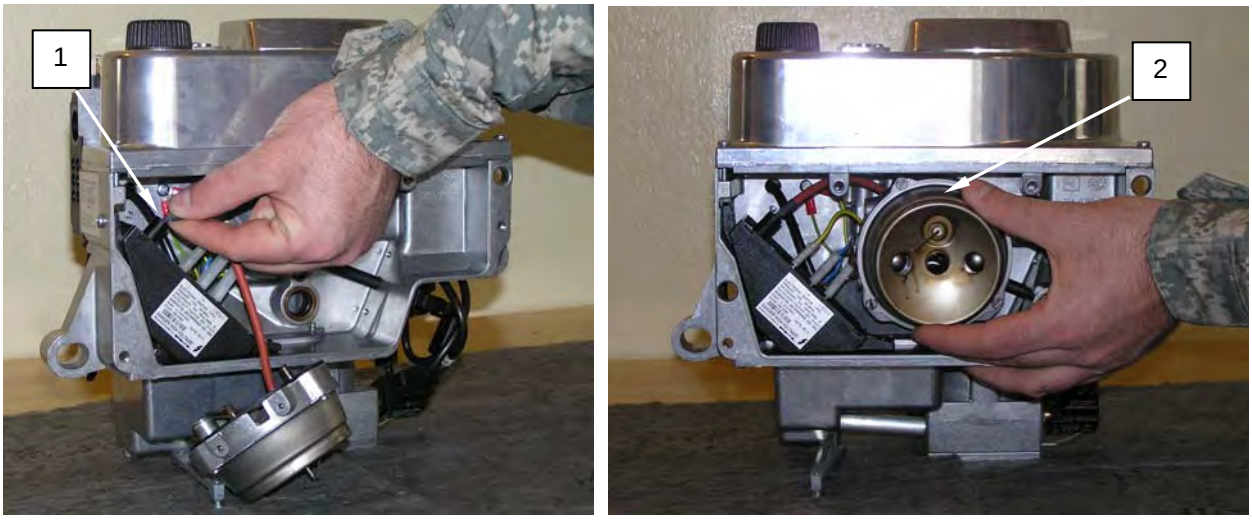


Figure 4. Atomizing Chamber Replacement.

7. Install the front flange of the lower fan housing (Figure 5, Item 1) to cover the atomizing chamber (Figure 5, Item 2). Secure by replacing and tightening the four flange retaining screws (Figure 5, Item 3). If the air tube/flame tube assembly (Figure 5, Item 4) was removed, replace it prior to placing front flange back on the lower housing.

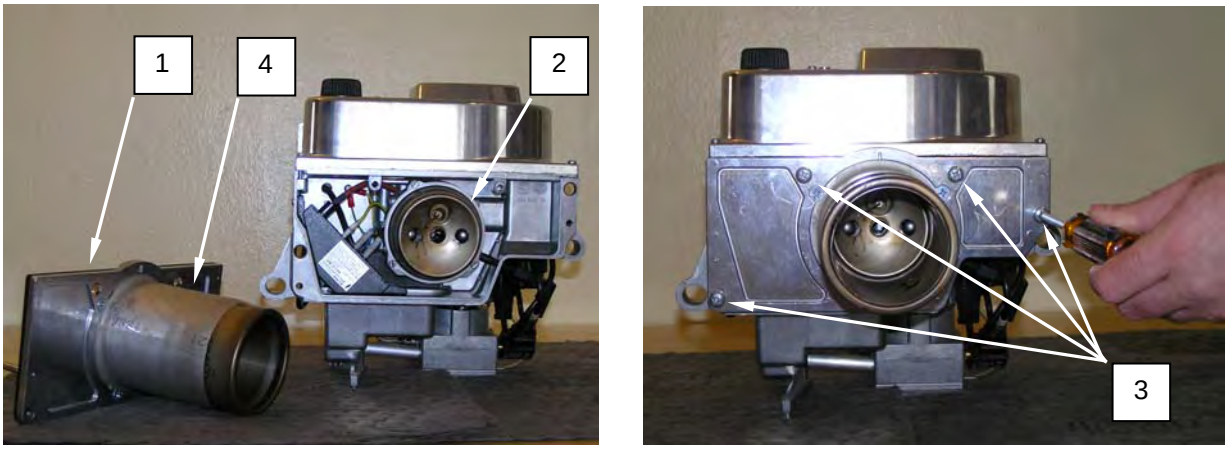


Figure 5. Lower Fan Housing Flange Replacement.

END OF TASK

REPLACE

1. Remove the front flange of the lower fan housing by removing the four screws (Figure 6, Item 1) to expose the atomizing chamber (Figure 6, Item 2). It is not necessary to remove the air tube/flame tube assembly (Figure 6, Item 3) from the front flange (Figure 6, Item 4).

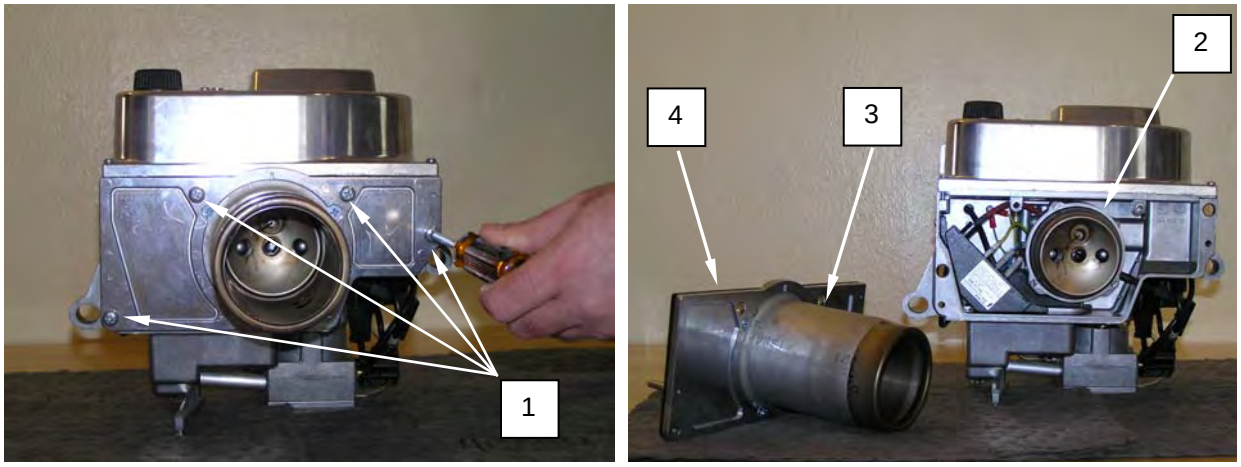


Figure 6. Lower Fan Housing Flange Removal.

2. Remove the atomizing chamber by pulling directly out (Figure 7, Item 1). Once removed, pull the igniter cable spade connector from the ignition transformer (Figure 7, Item 2).

3. Replace atomizing chamber with serviceable part from stock.

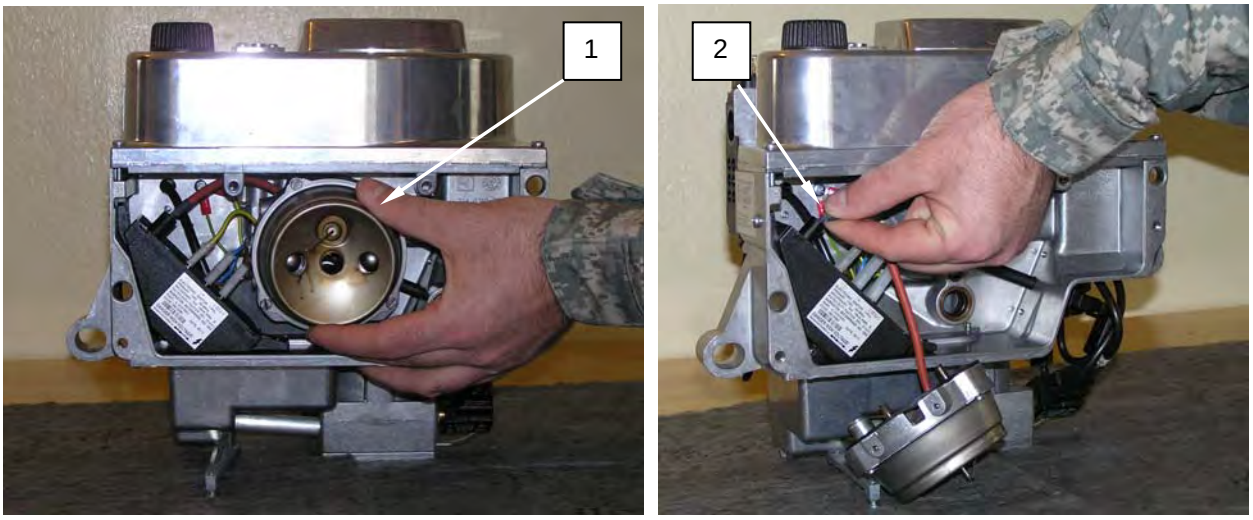


Figure 7. Atomizing Chamber Removal.

REPLACE - CONTINUED

4. Re-connect the igniter cable spade connector from the atomizing chamber to the ignition transformer (Figure 8, Item 1). Replace the atomizing chamber (Figure 8, Item 2) by inserting the tubing into the appropriate slots by hand.

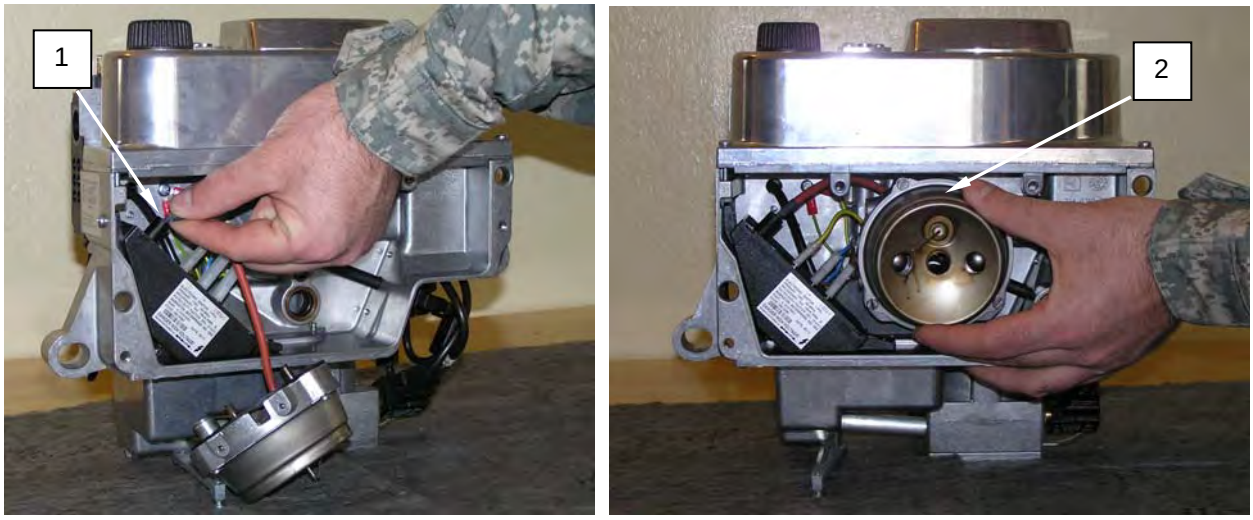


Figure 8. Atomizing Chamber Replacement.

5. Install the front flange of the lower fan housing (Figure 9, Item 1) to cover the atomizing chamber (Figure 9, Item 2). Secure by replacing and tightening the four flange retaining screws (Figure 9, Item 3). If the air tube/flame tube assembly (Figure 9, Item 4) was removed, replace it prior to placing front flange back on the lower housing.

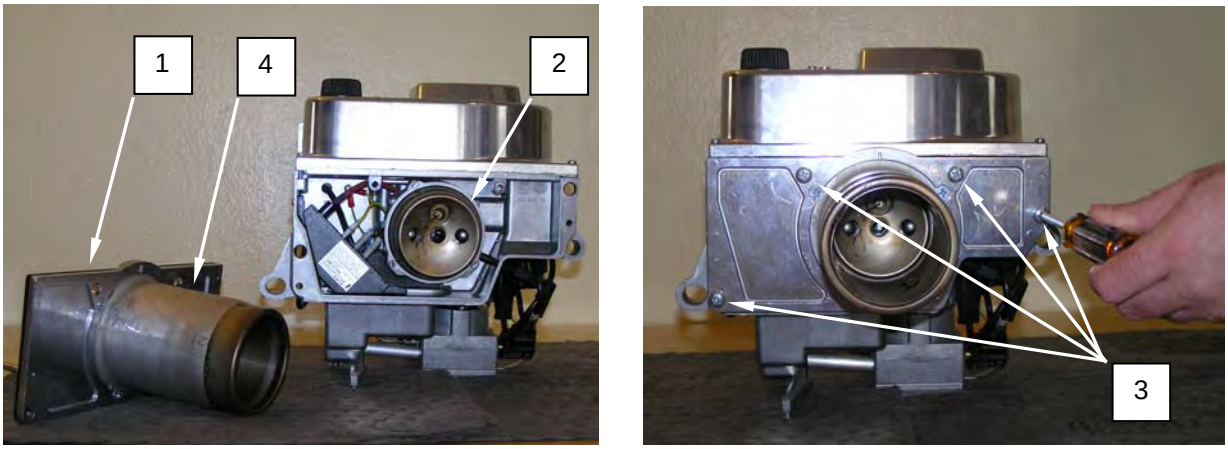


Figure 9. Lower Fan Housing Flange Replacement.

END OF TASK

END OF WORK PACKAGE

SERVICE MAINTENANCE

FUEL SUMP
REPLACE

INITIAL SETUP:

Tools and Special Tools

General Mechanic's Tool Kit: Automotive (GMTK) (WP 0066, Item 4)

Personnel Required

Quartermaster Equipment Repairer 63J (1)
Food Service Technician 3381 (1)

Materials/Parts

Oil and Water Absorbent Material (WP 0065, Item 1)
Chemical and Oil Protective Gloves (WP 0065, Item 9)
Industrial Goggles (WP 0065, Item 10)
Wiping Rag (WP 0065, Item 13)

Equipment Condition

TRH Burner removed from TRH (WP 0026)
Power disconnected from TRH

REPLACE

CAUTION

Ensure fuel is drained from TRH Burner IAW WP 0026. Failure to do so will cause damage to control box.

1. Remove five retaining screws from the fuel sump (Figure 1, Item 1 and Item 2).
2. Remove cross connection tube by pulling away from fuel sump (Figure 1, Item 3).

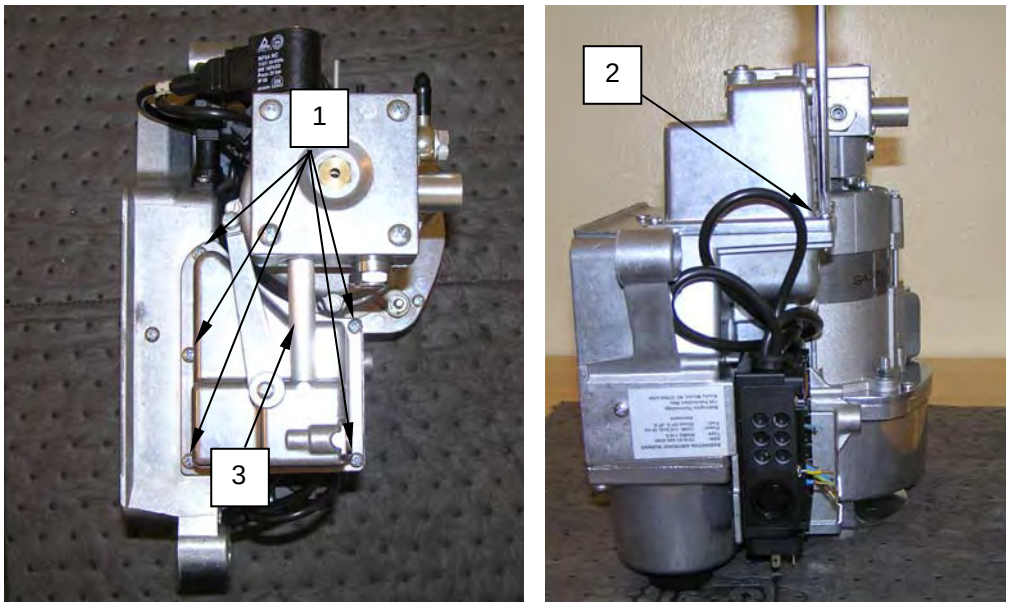


Figure 1. Fuel Sump Removal.

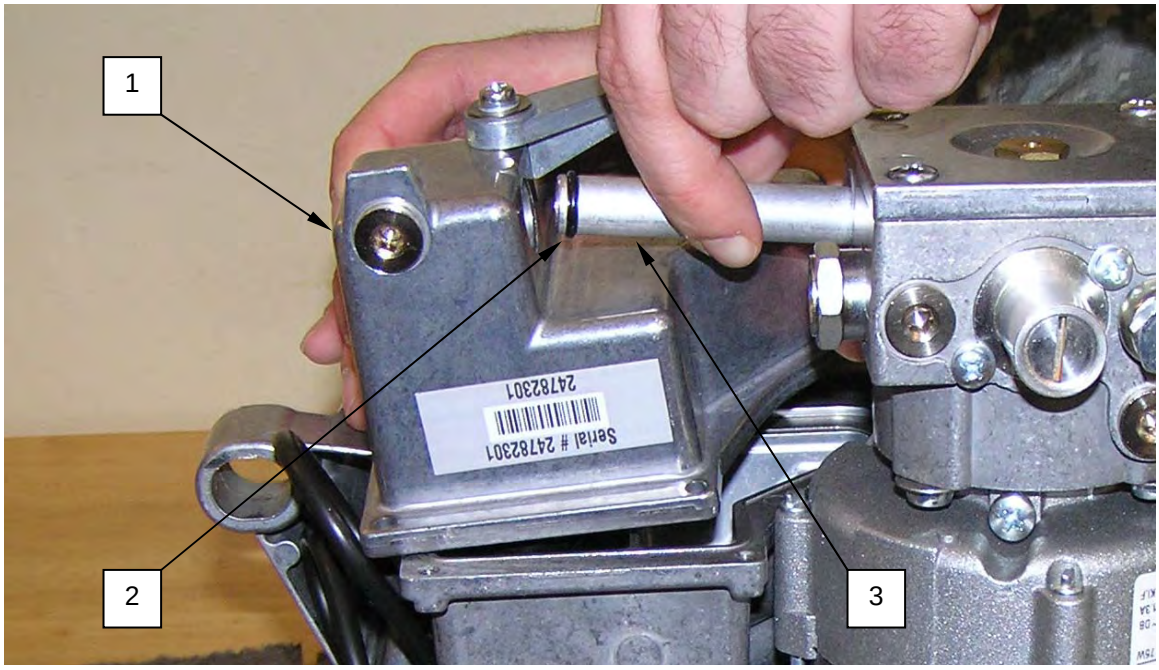
REPLACE – CONTINUED

3. Remove fuel sump (Figure 2, Item 1) from burner assembly.

4. Check the O-rings (Figure 2, Item 2) on the cross connection tube (Figure 2, Item 3) to make sure they are flexible and not damaged. Discard and replace any bad O-rings.

5. While gently twisting, reconnect the crossover tube (Figure 2, Item 3). When reconnecting the crossover tube, use a small amount of fuel to lubricate the O-rings (Figure 2, Item 2).

6. Align the crossover tube (Figure 2, Item 3), install the replacement sump (Figure 2, Item 1), and retain with five screws (Figure 2, Item 4).



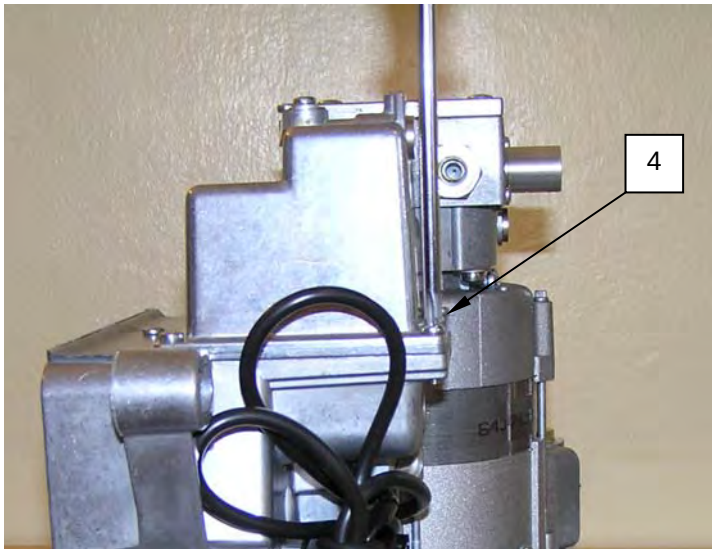


Figure 2. Install Replacement Fuel Sump.

END OF TASK

END OF WORK PACKAGE

SERVICE MAINTENANCE

PREPARATION FOR STORAGE AND SHIPMENT

INITIAL SETUP:

Tools and Special Tools	Personnel Required
General Mechanic's Tool Kit: Automotive (GMTK) (WP 0066, Item 4)	Quartermaster Equipment Repairer 63J (1) Food Service Technician 3381 (1)
Materials/Parts	**References**
Oil and Water Absorbent Material (WP 0065, Item 1) Wiping Rag (WP 0065, Item 13)	WP 0016 WP 0026 TM 38-230-2

ADMINISTRATIVE STORAGE (ARMY ONLY)

Placement of equipment in administrative storage should be for short periods of time when a shortage of maintenance effort exists. Items should be in mission readiness within 24 hours or within the time factors as determined by the directing authority. During the storage period appropriate maintenance records will be kept.

Before placing equipment in administrative storage, current maintenance services and equipment serviceability criteria (ESC) evaluations should be completed, shortcomings and deficiencies should be corrected, and all modification work orders (MWOs) should be applied.

Storage site selection. Inside storage is preferred for items selected for administrative storage. If inside storage is not available, trucks, vans, CONEX containers may be used.

PREPARATION FOR STORAGE AND SHIPMENT (ARMY ONLY)

Preservation, packaging, and packing of military supplies and equipment are described in TM 38-230-2.

STORAGE (ARMY ONLY)

NOTE

Be sure the storage location is on firm, level ground and at a well-drained site.

Store equipment in a building, shed, or under cover. If the equipment is to be stored outside, place on a pallet or planking; place a canvas tarp or waterproof cover over it.

To prepare the TRH for storage, it is necessary to remove the TRH Burner and drain the TRH Burner of fuel IAW WP 0026. Replace the burner in the TRH burner compartment IAW WP 0026.

The TRH and AK components should be cleaned and stored indoors or in the Quadcon provided or IAW Unit SOP.

PACKING FOR SHIPMENT (ARMY ONLY)

If available, use original packing materials and shipping cartons or a suitable substitute.

STORAGE (MARINE CORPS ONLY)

Follow established procedures when packing the TRH and AK accessories for storage. The AK can operate in diverse environments. Accordingly, most enclosed storage facilities are adequate for storage of the system. Initial checkout and adjustment procedures outlined in WP 0016 should be followed prior to placing the AK in service after any period of storage. When not in use, the AK should be stored in the Quadcon provided. The AK should never be left unprotected outdoors.

SHIPMENT (MARINE CORPS ONLY)

The AK can be transported overland without restrictions, provided it is properly secured in a HMMWV or within a Quadcon.

END OF WORK PACKAGE

CHAPTER 8

FIELD MAINTENANCE INSTRUCTIONS FOR ASSAULT KITCHEN

FIELD MAINTENANCE

LID ASSEMBLY REPAIR

INITIAL SETUP:

Tools and Special Tools	Personnel Required
Standard Automotive Tool Set (SATS) (WP 0066, Item 5)	Metal Worker 44B (1) Machinist 44E (1)
Materials/Parts	**References**
Pop Rivet (WP 0065, Item 14)	WP 0022

REPAIR

Lid Assembly repair consists of replacing the rubber strip.

1. Remove lid (Figure 1, Item 1) from TRH IAW WP 0022 and place top down.
2. Drill out the rivets that hold the four gasket flanges (Figure 1, Item 2) in place. Discard rivets. If screws are used to secure the gasket flanges to the lid, remove the screws and set aside.
3. Remove damaged lid gasket (Figure 1, Item 3) and replace with new lid gasket.
4. Adjust lid gasket flanges (Figure 1, Item 2) around new lid gasket (Figure 1, Item 3) and align holes in flanges with holes in lid (Figure 1, Item 1).
5. Secure lid gasket flanges (Figure 1, Item 2) with rivets.
6. Install lid (Figure 1, Item 1) on TRH tank IAW WP 0022.

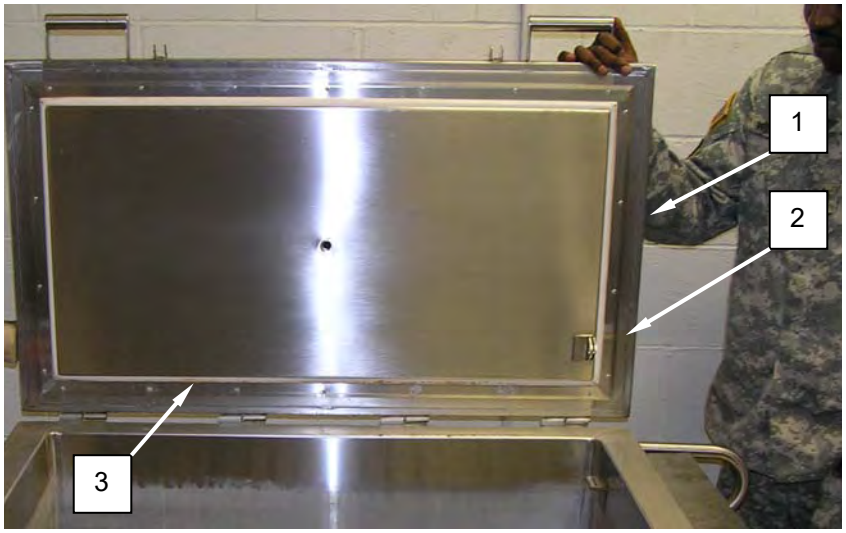


Figure 1. Replacing TRH Lid Gasket.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE

TANK ASSEMBLY REPAIR

INITIAL SETUP:

Tools and Special Tools

Standard Automotive Tool Set (SATS) Base (WP 0066, Item 5)
Arc Welding Machine (TIG) (WP 0066, Item 6)

Materials/Parts

Pop Rivet (WP 0065, Item 14)
Stainless Welding Rod (WP 0065, Item 15)

Personnel Required

Metal Worker 44B (1)

Machinist 44E (1)

Equipment Condition

Tank empty and drained

References

WP 0022

REPAIR

Repair of the TRH Tank consists of welding minor cracks in the TRH Tank body and replacing the lid latches and/or lid latch catch plates.

Tank and Lid Welding Repair

Weld cracks in the TRH tank body using standard stainless steel welding procedures and local SOP.

WARNING

The TRH weighs approximately 320 pounds when empty and 525 pounds when full. Proper lifting technique is required to prevent damage to equipment and personnel. Always drain water tank before lifting or moving TRH. Four (4) persons must be used to move the TRH onto its top, lifting with legs, not back, to prevent injury. Do not use the lid handles to move the TRH, use the two lift bars on the TRH.

NOTE

The TRH Tank, Tank Lid and other components of the TRH are made of varying gauges of T304 Stainless Steel that requires precision welding using TIG welding equipment. Repairs of minor cracks, splits or broken welds will be determined by the Senior Field Maintenance Supervisor, based on the availability of proper welding equipment and materials. Assessment of reparability will also be based upon the size, location and impact on TRH performance of the damage. Severe crushing or large punctures of the tank or lid can be rationale for a “not economically repairable” determination by the Senior Field Maintenance Supervisor.

1. If determined to be feasible, repair minor cracks, splits or broken welds using standard TIG welding procedures.

2. Carefully grind and polish the weld for a finished appearance.

END OF TASK

REPAIR - CONTINUED

Lid Latch Replacement

NOTE

The TRH tank is made of stainless steel, and must be welded with gas shielded arc welders or with stainless steel rods specifically made for conventional arc welders.

1. Remove the damaged lid latch (Figure 1, Item 1) by sawing with a metal cutting saw.

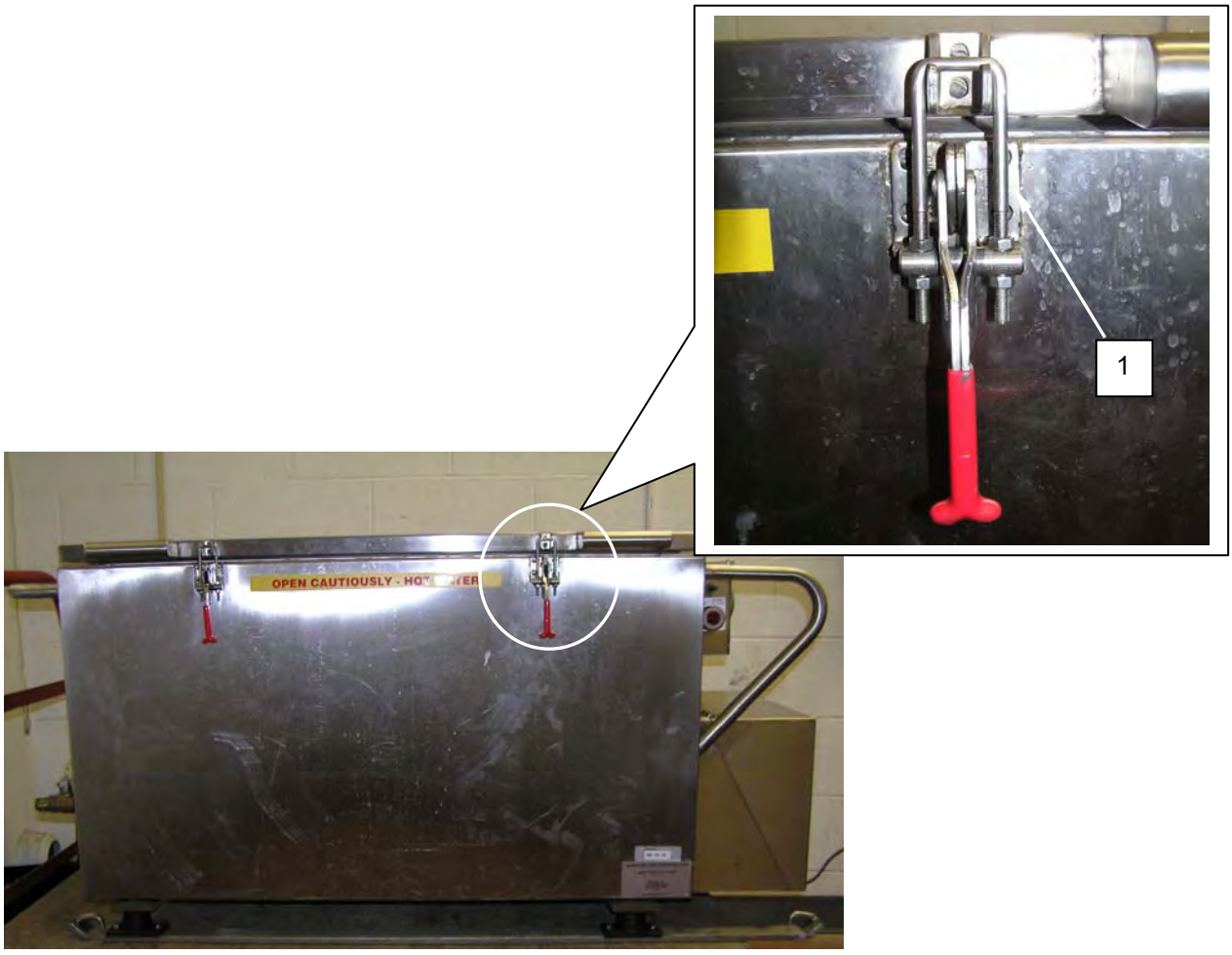


Figure 1. Lid Latch Placement.

2. Using a grinding wheel, smooth the area around the sawed-off latch.
3. Align a replacement latch to TRH tank.
4. Secure latch to TRH tank body with four pop rivets.
5. Ensure proper latch function by operating lid latch.
6. Adjust lid latch IAW WP 0022.

END OF TASK

REPAIR - CONTINUED

Lid Latch Catch Plate Replacement

NOTE

The TRH tank is made of stainless steel, and must be welded with gas shielded arc welders or with stainless steel rods specifically made for conventional arc welders.

1. Remove the damaged lid latch catch plate (Figure 2, Item 1) by sawing with a metal cutting saw.

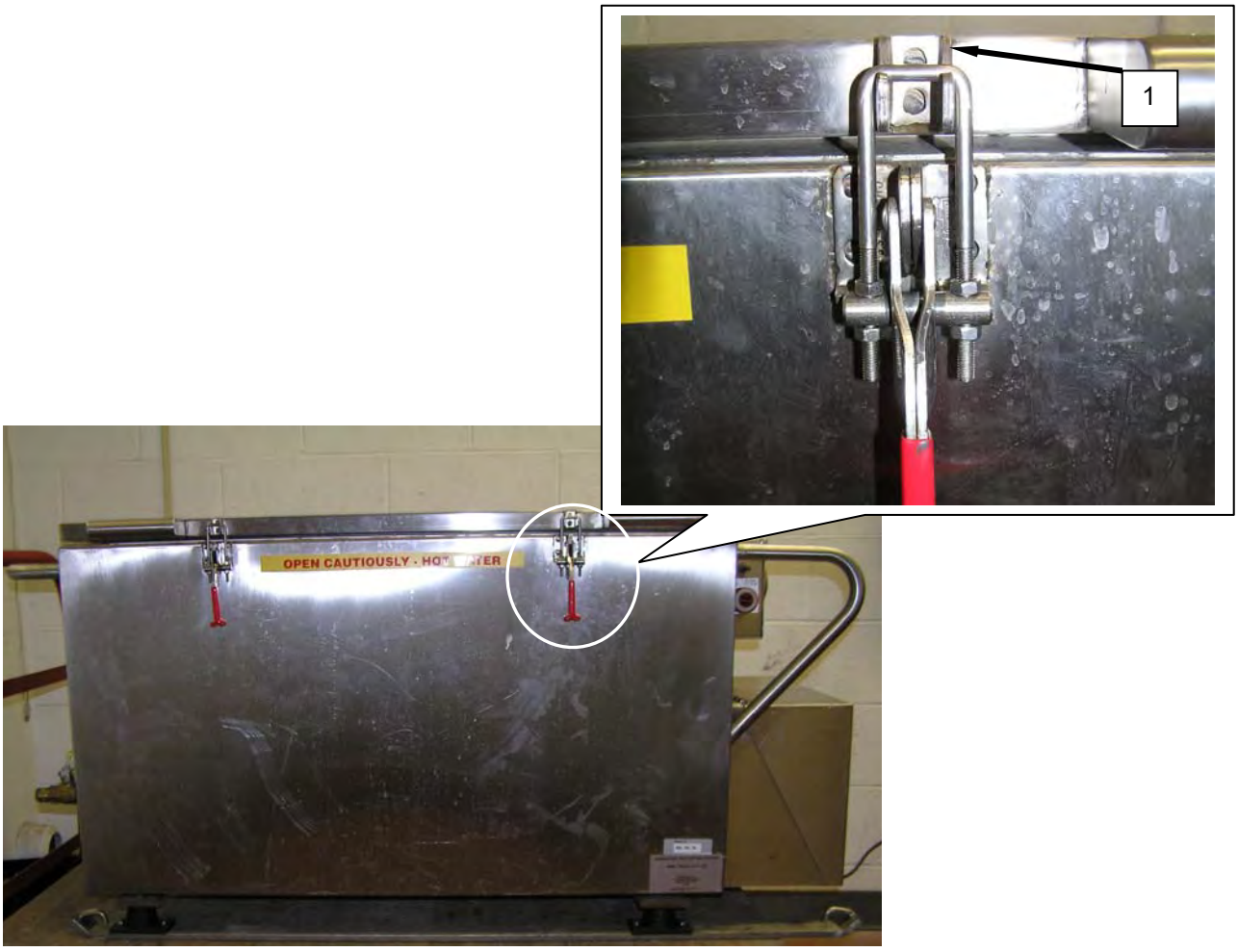


Figure 2. Lid Latch Catch Plate Placement.

2. Using a grinding wheel, smooth the area around the sawed-off latch.
3. Align replacement catch plate to TRH tank.
4. Secure catch plate to TRH tank body with two pop rivets.
5. Ensure proper latch function by operating lid latch.
6. Adjust lid latch IAW WP 0022.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE

TRAY RATION RACK REPAIR

INITIAL SETUP:

Tools and Special Tools

Welding Machine, Arc (TIG) (WP 0066, Item 6)

Personnel Required

Metal Worker 44B (1)
Machinist 44E (1)

Materials/Parts

Rod, Welding, Stainless (WP 0065, Item 15)

Equipment Condition

Tank empty and drained

References

WP 0020

REPAIR

NOTE

Damage to the tray ration rack may be repaired by welding. Do not attempt to weld a tray ration rack that has been damaged so that the structural integrity of the rack has been compromised.

1. Remove the tray ration rack IAW WP 0020.
2. Repair damaged tray ration rack (Figure 1, Item 1) by welding IAW unit welding SOP.
3. Install the tray ration rack IAW WP 0020.

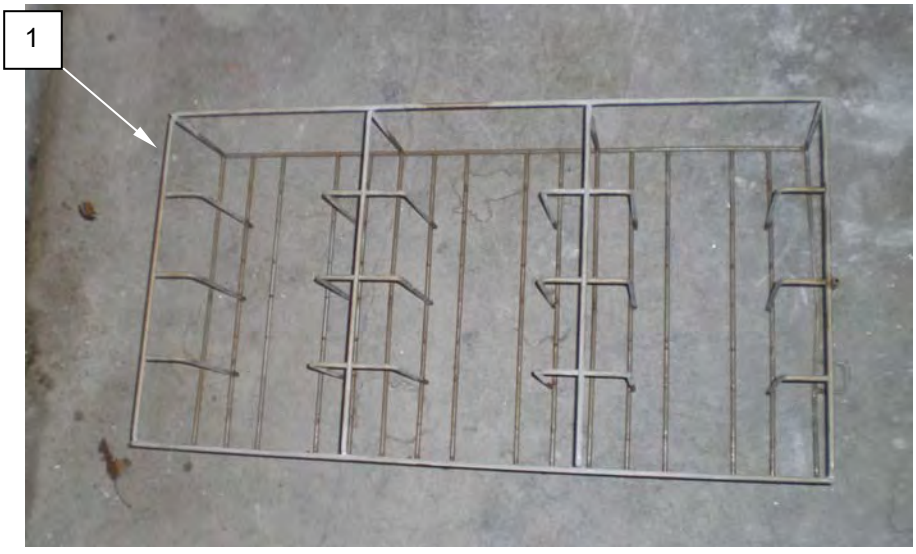


Figure 1. Tray Ration Rack.

END OF TASK

END OF WORK PACKAGE

CHAPTER 9

PARTS INFORMATION
FOR
ASSAULT KITCHEN

OPERATOR AND FIELD MAINTENANCE

REPAIR PARTS AND SPECIAL TOOLS LIST (RPSTL)

INTRODUCTION

INTRODUCTION

SCOPE

This RPSTL lists and authorizes spares and repair parts; special tools; special test, measurement, and diagnostic equipment (TMDE); and other special support equipment required for performance of operator and field maintenance of the Assault Kitchen. It authorizes the requisitioning, issue, and disposition of spares, repair parts, and special tools as indicated by the source, maintenance, and recoverability (SMR) codes.

GENERAL

In addition to the Introduction work package, this RPSTL is divided into the following work packages.

1. Repair Parts List Work Packages. Work packages containing lists of spares and repair parts authorized by this RPSTL for use in the performance of maintenance. These work packages also include parts which must be removed for replacement of the authorized parts. Parts lists are composed of functional groups in ascending alphanumeric sequence, with the parts in each group listed in ascending figure and item number sequence. Sending units, brackets, filters, and bolts are listed with the component they mount on. Bulk materials are listed by item name in FIG. BULK at the end of the work packages. Repair parts kits are listed at the end of the individual work packages. Repair parts for reparable special tools are also listed in a separate work package. Items listed are shown on the associated illustrations.

2. Special Tools List Work Packages. Work packages containing lists of special tools, special TMDE, and special support equipment authorized by this RPSTL (as indicated by Basis of Issue (BOI) information in the DESCRIPTION AND USABLE ON CODE (UOC) column). Tools that are components of common tool sets and/or Class VII are not listed.

3. Cross-Reference Indexes Work Packages. There are two cross-reference indexes work packages in this RPSTL: the National Stock Number (NSN) Index work package, and the Part Number (P/N) Index work package. The National Stock Number Index work package refers you to the figure and item number. The Part Number Index work package refers you to the figure and item number.

EXPLANATION OF COLUMNS IN THE REPAIR PARTS LIST AND SPECIAL TOOLS LIST WORK PACKAGES

ITEM NO. (Column (1)). Indicates the number used to identify items called out in the illustration.

SMR CODE (Column (2)). The SMR code containing supply/requisitioning information, maintenance level authorization criteria, and disposition instruction, as shown in the following breakout. This entry may be subdivided into 4 subentries, on for each service.

TABLE 1. SMR Code Explanation.

Source Code XX	Maintenance Code XX		Recoverability Code X
1st two positions:	3rd position:	4th position:	5th position:
How to get an item.	Who can install, replace, or use the item.	Who can do complete repair* on the item.	Who determines disposition action on unserviceable items.

*Complete Repair: Maintenance capacity, capability, and authority to perform all corrective maintenance tasks of the "Repair" function in a use/user environment in order to restore serviceability to a failed item.

Source Code. The source code tells you how you get an item needed for maintenance, repair, or overhaul of an end item/equipment. Explanations of source codes follow:

Source Code	Application/Explanation
PA PB PC PD PE PF PG PH PR PZ	**NOTE** Items coded PC are subject to deterioration. Stock items; use the applicable NSN to requisition/request items with these source codes. They are authorized to the level indicated by the code entered in the 3rd position of the SMR code.
KD KF KB	Items with these codes are not to be requested/requisitioned individually. They are part of a kit which is authorized to the maintenance level indicated in the 3rd position of the SMR code. The complete kit must be requisitioned and applied.
MO-Made at service/AMC level MF-Made at field/ASB level MH-Made at below depot/Sustainment level ML-Made at SRA/TASMG MD-Made at depot MG-Navy only	Items with these codes are not to be requisitioned/requested individually. They must be made from bulk material which is identified by the part number in the DESCRIPTION AND USABLE ON CODE (UOC) column and listed in the bulk material group work package of the RPSTL. If the item is authorized to you by the 3rd position code of the SMR code, but the source code indicates it is made at higher level, order the item from the higher level of maintenance.
AO-Assembled by service/AMC level AF-Assembled by field/ASB level AH-Assembled by below depot sustainment level AL-Assembled by SRA/TASMG AD-Assembled by depot AG-Navy only	Items with these codes are not to be requested/requisitioned individually. The parts that make up the assembled item must be requisitioned or fabricated and assembled at the level of maintenance indicated by the source code. If the 3rd position of the SMR code authorizes you to replace the item, but the source code indicates the item is assembled at a higher level, order the item from the higher level of maintenance.
XA	Do not requisition an "XA" coded item. Order the next higher assembly.(Refer to NOTE below.)
XB	If an item is not available from salvage, order it using the CAGEC and part number.
XC	Installation drawings, diagrams, instruction sheets, field service drawings; identified by manufacturer's part number.
XD	Item is not stocked. Order an XD-coded item through normal supply channels using the CAGEC and part number given, if no NSN is available.

NOTE

Cannibalization or controlled exchange, when authorized, may be used as a source of supply for items with the above source codes except for those items source coded "XA" or those aircraft support items restricted by requirements of AR 750-1.

Maintenance Code. Maintenance codes tell you the level(s) of maintenance authorized to use and repair support items. The maintenance codes are entered in the third and fourth positions of the SMR code as follows:

Third Position. The maintenance code entered in the third position tells you the lowest maintenance level authorized to remove, replace, and use an item. The maintenance code entered in the third position will indicate authorization to the following levels of maintenance:

Maintenance Code	Application/Explanation
O* -	Field (Service) level/AMC maintenance can remove, replace, and use the item.
F -	Field/ASB maintenance can remove, replace, and use the item.
H -	Below Depot Sustainment maintenance can remove, replace, and use the item.
L -	Specialized repair activity/TASMG can remove, replace, and use the item.
G -	Afloat and ashore intermediate maintenance can remove, replace, and use the item (Navy only)
K -	Contractor facility can remove, replace, and use the item
Z -	Item is not authorized to be removed, replace, or used at any maintenance level
D -	Depot can remove, replace, and use the item.

*NOTE - Army may use C in the third position. However, for joint service publications, Army will use O.

Fourth Position. The maintenance code entered in the fourth position tells you whether or not the item is to be repaired and identifies the lowest maintenance level with the capability to do complete repair (perform all authorized repair functions).

NOTE

Some limited repair may be done on the item at a lower level of maintenance, if authorized by the Maintenance Allocation Chart (MAC) and SMR codes.

Maintenance Code	Application/Explanation
O -	Field (Service) /AMC is the lowest level that can do complete repair of the item.
F -	Field/ASB /ASB is the lowest level that can do complete repair of the item.
H -	Below Depot Sustainment is the lowest level that can do complete repair of the item.
L -	Specialized repair activity (enter specialized repair activity designator) is the lowest level that can do complete repair of the item.
D -	Depot is the lowest level that can do complete repair of the item.
G -	Both afloat and ashore intermediate levels are capable of complete repair of item. (Navy only)
K -	Complete repair is done at contractor facility
Z -	Nonreparable. No repair is authorized.
B-	No repair is authorized. No parts or special tools are authorized for maintenance of "B" coded item. However, the item may be reconditioned by adjusting, lubricating, etc., at the user level.

Recoverability Code. Recoverability codes are assigned to items to indicate the disposition action on unserviceable items. The recoverability code is shown in the fifth position of the SMR code as follows:

Recoverability Code	Application/Explanation
Z -	Nonreparable item. When unserviceable, condemn and dispose of the item at the level of maintenance shown in the third position of the SMR code.
O -	Reparable item. When uneconomically reparable, condemn and dispose of the item at the service/AMC level.
F -	Reparable item. When uneconomically reparable, condemn and dispose of the item at the field level/ASB.
H -	Reparable item. When uneconomically reparable, condemn and dispose of the item at the below depot sustainment level.
D -	Reparable item. When beyond lower level repair capability, return to depot. Condemnation and disposal of item are not authorized below depot level.
L -	Reparable item. Condemnation and disposal not authorized below Specialized Repair Activity (SRA) or theater aviation sustainment maintenance group (TASMG).
A -	tem requires special handling or condemnation procedures because of specific reasons (such as precious metal content, high dollar value, critical material, or hazardous material). Refer to appropriate manuals/directives for specific instructions.
G -	Field level reparable item. Condemn and dispose at either afloat or ashore intermediate levels. (Navy only)
K -	Reparable item. Condemnation and disposal to be performed at contractor facility

NSN (Column (3)). The NSN for the item is listed in this column.

CAGEC (Column (4)). The Commercial and Government Entity Code (CAGEC) is a five-digit code which is used to identify the manufacturer, distributor, or Government agency/activity that supplies the item.

PART NUMBER (Column (5)). Indicates the primary number used by the manufacturer (individual, company, firm, corporation, or Government activity), which controls the design and characteristics of the item by means of its engineering drawings, specifications, standards, and inspection requirements to identify an item or range of items.

NOTE

When you use an NSN to requisition an item, the item you receive may have a different part number from the number listed.

DESCRIPTION AND USABLE ON CODE (UOC) (Column (6)). This column includes the following information:

1. The federal item name, and when required, a minimum description to identify the item.
2. Part numbers of bulk materials are referenced in this column in the line entry to be manufactured or fabricated.
3. Hardness Critical Item (HCI). A support item that provides the equipment with special protection from electromagnetic pulse (EMP) damage during a nuclear attack.
4. The statement END OF FIGURE appears just below the last item description in column (6) for a given figure in both the repair parts list and special tools list work packages.

QTY (Column (7)). The QTY (quantity per figure) column indicates the quantity of the item used in the breakout shown on the illustration/figure, which is prepared for a functional group, subfunctional group, or an assembly. A "V" appearing in this column instead of a quantity indicates that the quantity is variable and quantity may change from application to application.

USMC QTY per Equip (Column (8)). This column accommodates the Marine Corps quantity Per equipment requirement.

EXPLANATION OF CROSS-REFERENCE INDEXES WORK PACKAGES FORMAT AND COLUMNS

1. National Stock Number (NSN) Index Work Package. NSN's in this index are listed in National Item Identification Number (NIIN) sequence.

STOCK NUMBER Column. This column lists the NSN in NIIN sequence. The NIIN consists of the last nine digits of the NSN. When using this column to locate an item, ignore the first four digits of the NSN. However, the complete NSN should be used when ordering items by stock number. For example, if the NSN is 5385-01-574-1476, the NIIN is 01-574-1476.

FIG. Column. This column lists the number of the figure where the item is identified/located. The figures are in numerical order in the repair parts list and special tools list work packages.

ITEM Column. The item number identifies the item associated with the figure listed in the adjacent FIG. column. This item is also identified by the NSN listed on the same line.

2. Part Number (P/N) Index Work Package. Part numbers in this index are listed in ascending alphanumeric sequence (vertical arrangement of letter and number combinations which places the first letter or digit of each group in order A through Z, followed by the numbers 0 through 9 and each following letter or digit in like order).

PART NUMBER Column. Indicates the part number assigned to the item.

FIG. Column. This column lists the number of the figure where the item is identified/located in the repair parts list and special tools list work packages.

ITEM Column. The item number is the number assigned to the item as it appears in the figure referenced in the adjacent figure number column."

SPECIAL INFORMATION

UOC. The UOC appears in the lower left corner of the Description Column heading. Usable on codes are shown as "UOC:..." in the Description Column (justified left) on the first line under the applicable item/nomenclature. Uncoded items are applicable to all models. Identification of the UOCs used in the RPSTL are:

Code	Used On
FXC	Assault Kitchen (Tan)
FWW	Assault kitchen (Green)

Fabrication Instructions. Bulk materials required to manufacture items are listed in the bulk material functional group of this RPSTL. Part numbers for bulk material are also referenced in the Description Column of the line item entry for the item to be manufactured/fabricated.

Index Numbers. Items which have the word BULK in the figure column will have an index number shown in the item number column. This index number is a cross-reference between the NSN / Part Number (P/N) Index work packages and the bulk material list in the repair parts list work package.

HOW TO LOCATE REPAIR PARTS

1. When NSNs or Part Numbers Are Not Known.

First. Using the table of contents, determine the assembly group to which the item belongs. This is necessary since figures are prepared for assembly groups and subassembly groups, and lists are divided into the same groups.

Second. Find the figure covering the functional group or the subfunctional group to which the item belongs.

Third. Identify the item on the figure and note the number(s).

Fourth. Look in the repair parts list work packages for the figure and item numbers. The NSNs and part numbers are on the same line as the associated item numbers.

2. When NSN Is Known.

First. If you have the NSN, look in the STOCK NUMBER column of the NSN index work package. The NSN is arranged in NIIN sequence. Note the figure and item number next to the NSN.

Second. Turn to the figure and locate the item number. Verify that the item is the one you are looking for.

3. When Part Number Is Known.

First. If you have the part number and not the NSN, look in the PART NUMBER column of the part number index work package. Identify the figure and item number.

Second. Look up the item on the figure in the applicable repair parts list work package.

END OF WORK PACKAGE

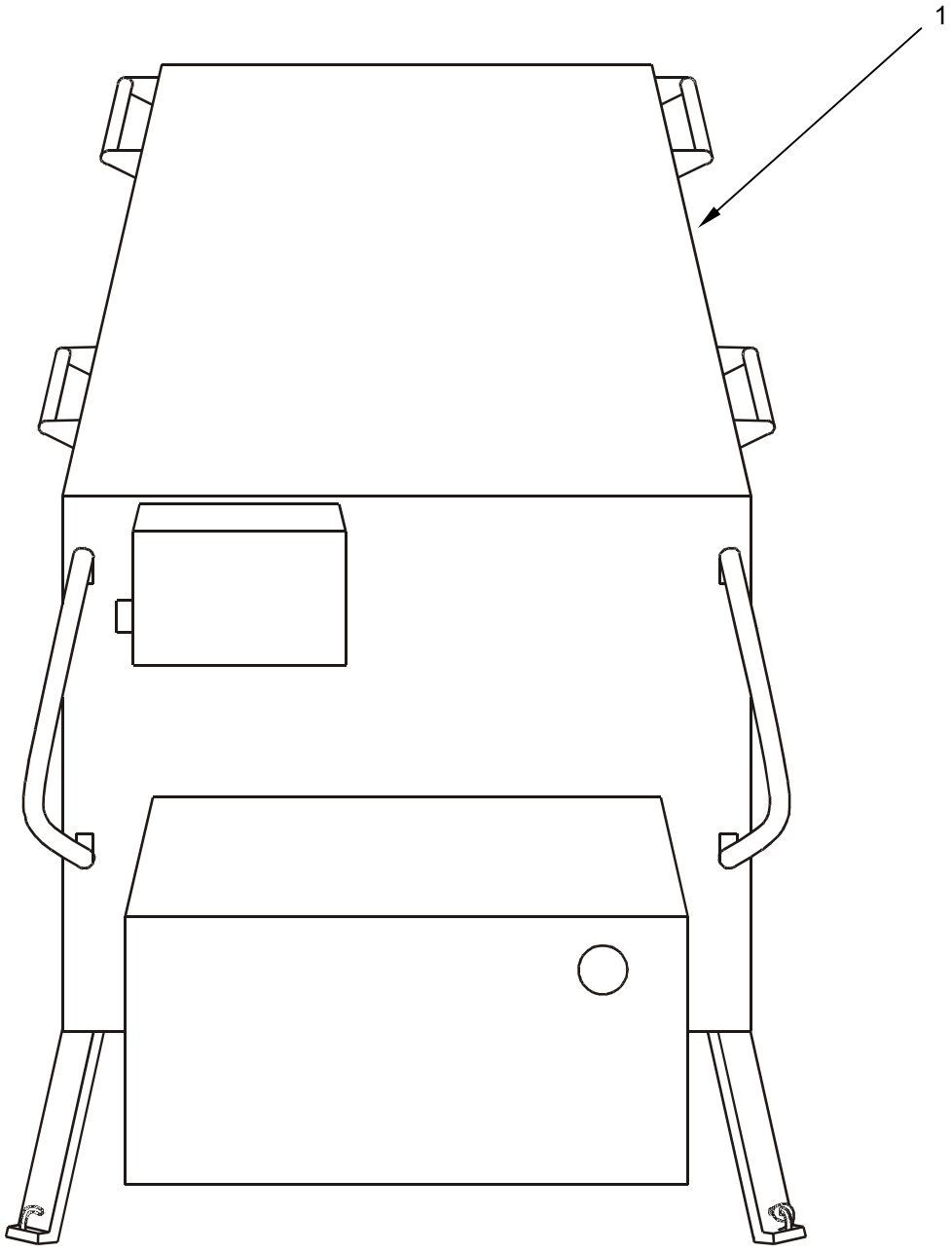


Figure 1. Tray Ration Heater (Sheet 1 of 4).

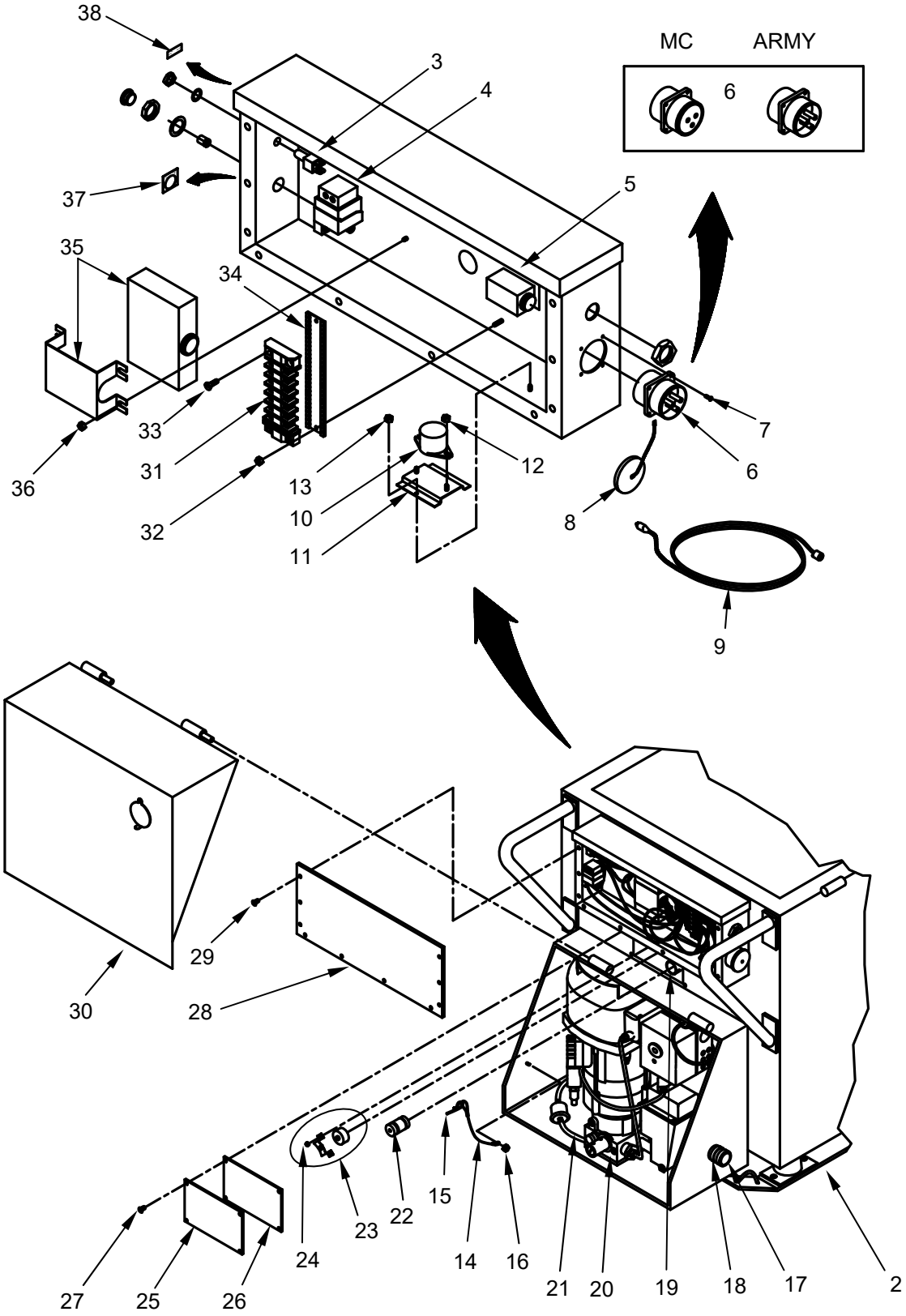


Figure 2. Tray Ration Heater (Sheet 2 of 4).

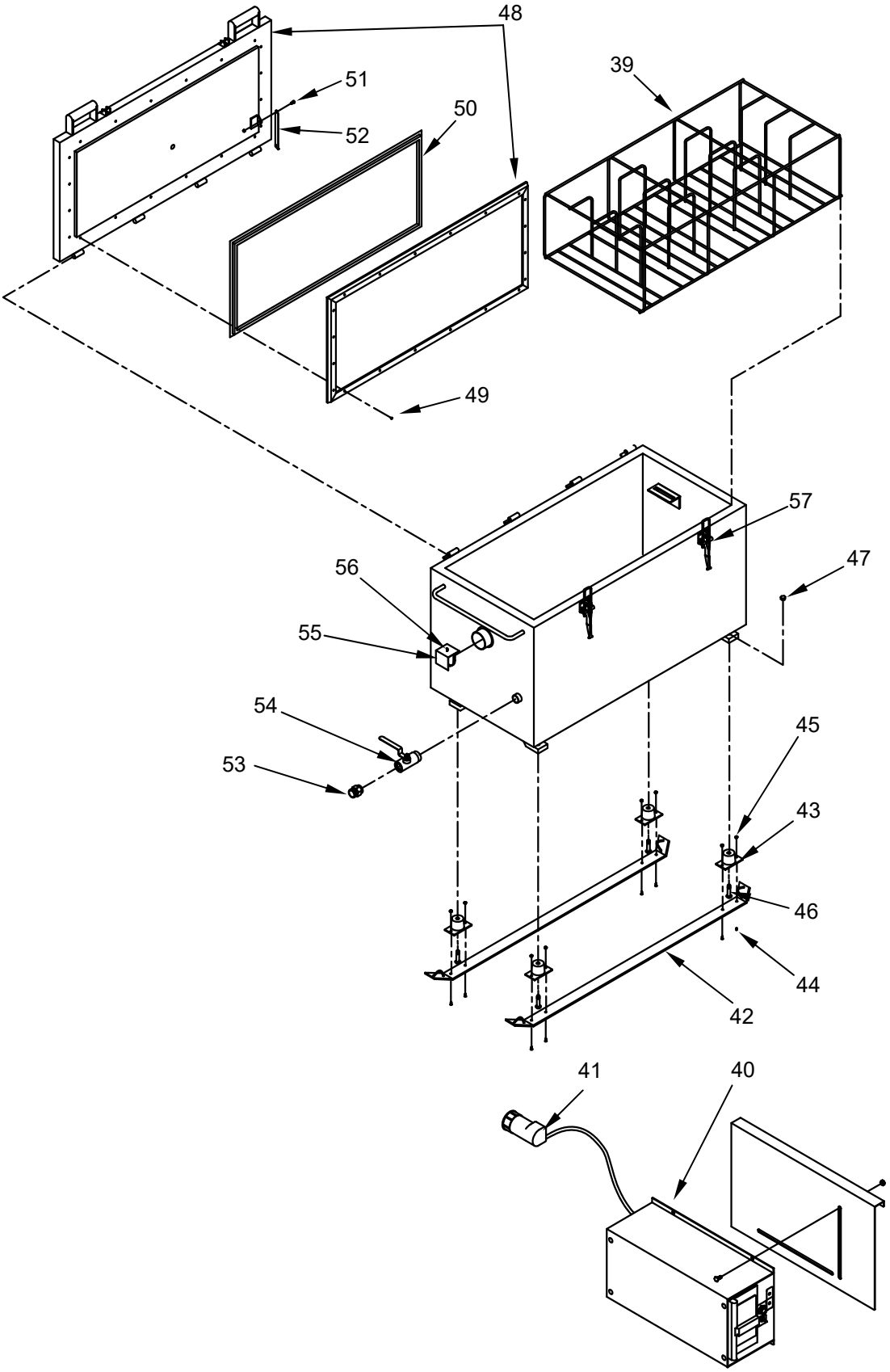


Figure 2. Tray Ration Heater (Sheet 3 of 4).

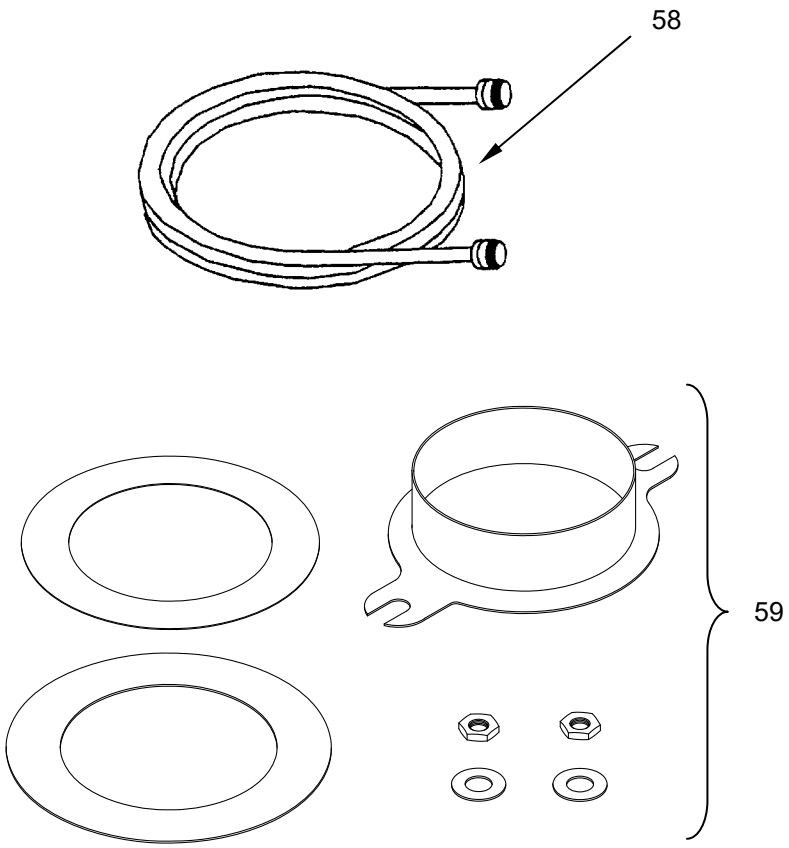


Figure 2. Tray Ration Heater (Sheet 4 of 4).

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY	(8) MC QTY
					GROUP 01		
					FIG. 2 TRAY RATION HEATER		
1	PAOFF	7360-01-570-9851	04AL0	TRH AKB31008	HEATER, TRAY RATION	1	0
1	PAOFF	7310-01-514-1420	04AL0	TRH 2000	HEATER, TRAY RATION	0	1
2	XAOOO		04AL0	TRH AK1008	. ASSEMBLY, TANK	1	0
2	PAOFF	7310-01-493-2193	04AL0	TRH 2050	. ASSEMBLY, TANK	0	1
3	PAOZZ	5930-01-206-2693	73559	2FA5473	. . SWITCH, TOGGLE	1	1
4	PBOZZ	5999-01-442-7643	01121	800H-FRXT QI0RD4	. . LIGHT-SWITCH, PUSH-PULL, 120.0 V	1	1
5	PBOZZ	5925-00-283-6048	77342	W58-XBIA4A-5	. . CIRCUIT BREAKER	1	1
6	PBOZZ	5935-00-197-6556	77820	PTO2E-12-3S	. . CONNECTOR, RECEPTACLE ELECTRICAL (MC ONLY)	0	1
6	XDOZZ		04AL0	PTO2E–12–3P	. . CONNECTOR, RECEPTACLE ELECTRICAL (ARMY ONLY)	1	0
7	PAOZZ	5305-00-063-9610	02734	8914385-6	. . . SS SCREW, 4-40 X 1/4”, 18-8, PHILLIPS PAN HEAD, MACHINE	4	4
8	PBOZZ	5935-01-195-2337	96906	MS3181-12CA	. . . COVER, ELECTRICAL CONNECTOR	1	1
9	XDOZZ		04AL0	AK1630F	. . POWER CORD	1	0
9	PBOZZ	7360-01-514-1432	04AL0	16/3SOJ/SOW	. . POWER CORD	0	1
10	PAOZZ	5930-01-492-7272	0JW91	TOS-12C-LI	. MERCURY TILT SWITCH	1	1
11	PAOZZ	5340-01-492-6739	04AL0	B42000-95-0022	. MOUNTING PLATE	1	1
12					DELETED		
13					DELETED		
14	PBOZZ	4010-01-533-4957	04AL0	90312A210	. . WIRE ROPE ASSEMBLY, SINGLE LEG	2	2
15	PBOZZ	5315-01-128-6802	18876	13054541	. . PIN, LOCK	2	2
16					DELETED		
17	PBOZZ	4730-01-220-0026	02570	B-QC4-B1-400K1	. . COUPLING HALF, QUICK DISCONNECT	1	1
18	PBOZZ	4730-01-380-6025	02570	B-QC4-D-4HC	. . COUPLING HALF, QUICK DISCONNECT	1	1
19	PBOZZ	4730-01-492-9241	04AL0	TRH1313	. . ADAPTER BUSHING	1	1
20	PAOOO	7310-01-442-8340	04AL0	B42000-95-0001	BURNER,MULTI-FUEL (SEE FIGURE 2 FOR BREAKDOWN)	1	1
21	PAOZZ	4720-01-493-1830	04AL0	TRH-FLA-001	. . HOSE ASSEMBLY, NON-METALLIC	1	1
22	PBOZZ	7310-01-493-2287	04AL0	TRH1314	. . PROBE, MARTRON SENSOR	1	1
23	PBOZZ	5905-01-443-9038	04AL0	60T21X-1236G	. . RESISTOR, THERMAL	1	1

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY	(8) MC QTY
24					DELETED		
25					DELETED		
26					DELETED		
27					DELETED		
28	PBOZZ	5340-01-493-2135	04AL0	TRH1201B	. . COVER, ELECTRICAL BOX	1	1
29					DELETED		
30	PBOZZ	5340-01-493-2154	04AL0	TRH1260	. . COVER, ACCESS	1	1
31	PBOZZ	5940-00-458-0060	01121	1492-F1	. . TERMINAL JUNCTION BLOCK SECTION	1	1
32					DELETED		
33					DELETED		
34	PBOZZ	5975-01-290-7638	01121	1492-N23	. . . END SECTION, TERMINAL JUNCTION BLOCK	2	2
35	PBOZZ	5930-01-492-9245	04AL0	16-01	. . LIQUID LEVEL SWITCH	1	1
36					DELETED		
37					DELETED		
38					DELETED		
39	PAOFF	7310-01-492-9254	04AL0	TRH931	. RACK, TRAY RATION	1	1
40	PAOZZ	6130-01-493-1792	04AL0	DUI-24/ 300Q	. INVERTER, POWER STATIC	1	1
41	PBOZZ	5920-00-424-8873	71400	AGC15	. . FUSE, CARTRIDGE	1	0
42	PAOFF	7310-01-493-1832	04AL0	TRH914	. SKID	2	2
43	PBOZZ	5342-01-443-9361	04AL0	4C979-R2	. MOUNT, RESILIENT, WEAPON SYSTEM	4	4
44	PBOZZ	5305-01-493-2214	39428	92210A583	. SCREW,CAP,SOCKET HEAD	8	8
45	PBOZZ	5310-01-493-2243	39428	91839A127	. NUT,SELF-LOCKING, CASTELLATED	8	8
46	PBOZZ	5306-01-463-2101	4P313	25795	. BOLT,MACHINE	4	4
47					DELETED		
48	PAOFF	7310-01-493-2195	04AL0	TRH2020	. ASSEMBLY, LID	1	1
49	PBOZZ	5320-01-177-7940	90915	90004155	. . RIVET, POP	12	12
50	PBOZZ	5330-01-455-2315	39428	8694K67	. . RUBBER STRIP	1	1
51	PBOZZ	5315-01-493-2189	04AL0	TRH928D	. PIN, STRAIGHT HEADED	1	1
52	PBOZZ	5340-01-493-2184	04AL0	TRH928A	. BRACKET, ANGLE	1	1
53	PBOZZ	4730-01-233-8396	39428	73605T92	. ADAPTER, STRAIGHT, PIPE TO HOSE	1	1
54	PAOZZ	4820-01-131-9521	25795	5X716	. VALVE, BALL	1	1
55	PAOZZ	4520-01-493-1836	04AL0	HMV500	. PIPE, EXHAUST	1	1
56	PBOZZ	5305-01-493-2489	04AL0	S10-32RC	. SCREW,MACHINE	1	1
57					DELETED		
58	PAOZZ	4720-01-493-1828	04AL0	TRH-FLT-001	. HOSE ASSEMBLY, NON-METALLIC	1	1
59	XDOZZ		04AL0	8747105	FLANGE MOUNT, REPLACEMENT (MC ONLY)	0	1
					END OF FIGURE		

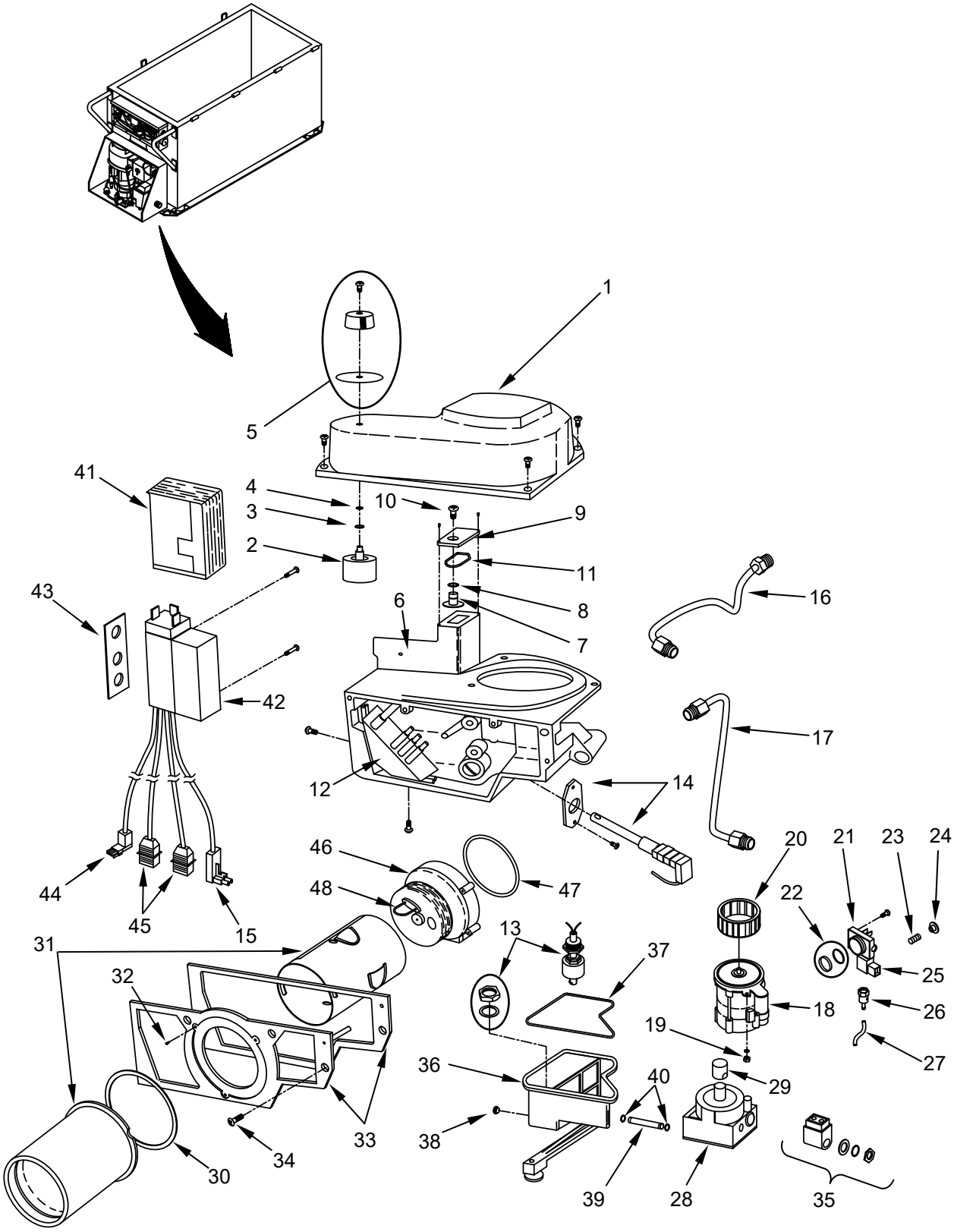


Figure 2. Burner, Multi-Fuel.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY	(8) MC QTY
					GROUP 0113		
					FIG. 2 BURNER, MULTI-FUEL		
1	PAOZZ	4140-01-533-2038	04AL0	B42000-98-0020	. HOUSING, CENTIFUGAL FAN	1	1
2	PAOZZ	7310-01-493-1801	04AL0	B42000-95-0021	. CONTROL, BLOWER AIR	1	1
3	PAOZZ	5331-01-533-4279	04AL0	9263K238	. . O-RING	1	1
4	PAOZZ	5331-01-533-4280	04AL0	9263K212	. . O-RING	2	2
5	PBOZZ				. DIAL ASSEMBLY, AIR CONTROL	1	1
6	PBOOO	4140-01-533-2053	04AL0	B42005-04-0023	. HOUSING, CENTRIFUGAL FAN	1	1
7	PAOZZ	4530-01-533-2037	04AL0	B42005-04-0024	. VALVE, REGULATING, FUEL OIL	1	1
8	XDOZZ		04AL0	01006219-0	. . O-RING,FLOW CONTROL MODULE INSERT, 1.6MMX4.1MM O.D.	1	1
9	PBOZZ	5340-01-492-6739	04AL0	B42000-95-0022	. PLATE, MOUNTING	1	1
10	PAOZZ	5305-01-484-0936	39428	92000A220	. SCREW, MACHINE	2	2
11	PAOZZ	5331-01-533-4494	04AL0	B42005-04-0024G	. O-RING	1	1
12	PAOZZ	7310-01-493-1726	04AL0	B42000-95-0029	. TRANSFORMER, IGNITION	1	1
13	PAOZZ	5930-01-492-9140	04AL0	B42000-95-0037	. SWITCH, LIQUID LEVEL	1	1
14	PAOZZ	5980-01-493-1761	04AL0	B42000-95-0018	. SEMICONDUCTOR DEVICE, PHOTO	1	1
15	PAOZZ	6150-01-533-4465	04AL0	B42005-95-0018C	. CABLE ASSEMBLY, SPECIAL PURPOSE	1	1
16	PAOZZ	4710-01-492-8200	04AL0	B42000-95-0007	. TUBE ASSEMBLY, METAL	1	1
17	PAOZZ	4710-01-492-9160	04AL0	B42000-95-0009	. TUBE ASSEMBLY, METAL	1	1
18	PAOZZ	6105-01-442-6342	04AL0	B42000-95-0002	. MOTOR, ALTERNATING CURRENT	1	1
19	PAOZZ	5310-01-493-2285	04AL0	B42000-95-0045	. NUT, MOTOR MOUNT	2	2
20	PAOZZ	4140-01-492-6709	04AL0	B42000-95-0038	. IMPELLER, FAN, CENTRIFUGAL	1	1
21	PAOZZ	5330-01-492-6731	04AL0	B42005-95-0003	. GASKET	1	1
22	PAOZZ	4310-01-492-8182	04AL0	B42000-95-0004	. PARTS KIT, PISTON ASSEMBLY O-RING (1) PISTON RING (1)	1	1
23	PAOZZ	4310-01-492-8190	04AL0	B42000-95-0005	. FILTER, ELEMENT INTAKE AIR	1	1
24	PAOZZ	5365-01-492-9147	04AL0	B42000-95-0044	. PLUG, MACHINE THREAD	1	1

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY	(8) MC QTY
25	PAOZA	4810-01-533-4207	04AL0	B42005-04-0013	. VALVE, SOLENOID	1	1
26	PAOZZ	4730-01-533-8368	04AL0	01005309	. TEE, PIPE	1	1
27	PAOZZ	4720-01-533-4407	04AL0	AAA00007	. TUBING, NONMETALLIC	1	1
28	PAOZZ	2910-01-442-2875	04AL0	B42000-95-0010	. PUMP,FUEL,ELECTRICAL	1	1
29	PAOZZ	3010-01-492-8203	04AL0	B42000-95-0011	. COUPLING, SHAFT, RIGID	1	1
30	PAOZZ	5330-01-533-4274	04AL0	8623K144G	. GASKET	1	1
31	PAOZZ	7310-01-492-9271	04AL0	B42000-95-0035	. TUBE ASSEMBLY, BURNER	1	1
32	PAOZZ	5305-01-493-2282	04AL0	B42000-95-0040	. . SCREW, FRONT PLATE	3	3
33	PAOZZ	5340-01-492-6700	04AL0	B42000-95-0031	. PLATE, MOUNTING	1	1
34	PAOZZ	5305-01-493-2282	04AL0	B42000-95-0040	. SCREW, FRONT PLATE	4	4
35	PAOZZ	4810-01-533-2068	04AL0	B42005-04-0006	. VALVE, SOLENOID	1	1
36	PAOZZ	7310-01-533-2095	04AL0	B42005-04-0025	. FUEL SUMP, LARGE WIT	1	1
37	XDOZZ		04AL0	B42005-04-0025G	. . GASKET, O-RING, SUMP BODY	1	1
38	PAOZZ	5365-01-492-9147	04AL0	B42000-95-0044	. PLUG, MACHINE THREAD	1	1
39	PAOZZ	4710-01-492-9150	04AL0	B42000-95-0026	. TUBE, METALLIC	1	1
40	PBOZZ	5331-01-149-6629	04AL0	01006327-0	. . . O-RING,CROSSOVER TUBE	2	2
41	PAOZZ	4540-01-493-1729	04AL0	B42000-95-0017	. CONTROL, FLAME SAFEGUARD	1	1
42	PAOZZ	7310-01-493-1765	04AL0	B42000-95-0016	. BASE, CONTROL BOX	1	1
43	PAOZZ	5340-01-533-4450	04AL0	B42005-95-0016S	. COVER, ACCESS	1	1
44	PAOZZ	6150-01-492-8211	04AL0	B42000-95-0014	. CABLE ASSEMBLY, POWER, ELECTRICAL	2	2
45	PAOZA	6150-01-533-4483	04AL0	B42005-98-002C	. CABLE ASSEMBLY, SPECIAL PURPOSE	1	1
46	PAOZZ	7310-01-492-9267	04AL0	B42000-95-0027	. CHAMBER, ATOMIZING	1	1
47	XDOZZ		04AL0	B42000-95-0027G	. . GASKET, BACKPLATE	1	1
48	PAOZZ	4520-01-492-6662	04AL0	B42000-95-0028	. IGNITER, SPARK, FUEL	1	1

END OF FIGURE

OPERATOR AND FIELD MAINTENANCE

CRADLE ASSEMBLY, COOKING POT

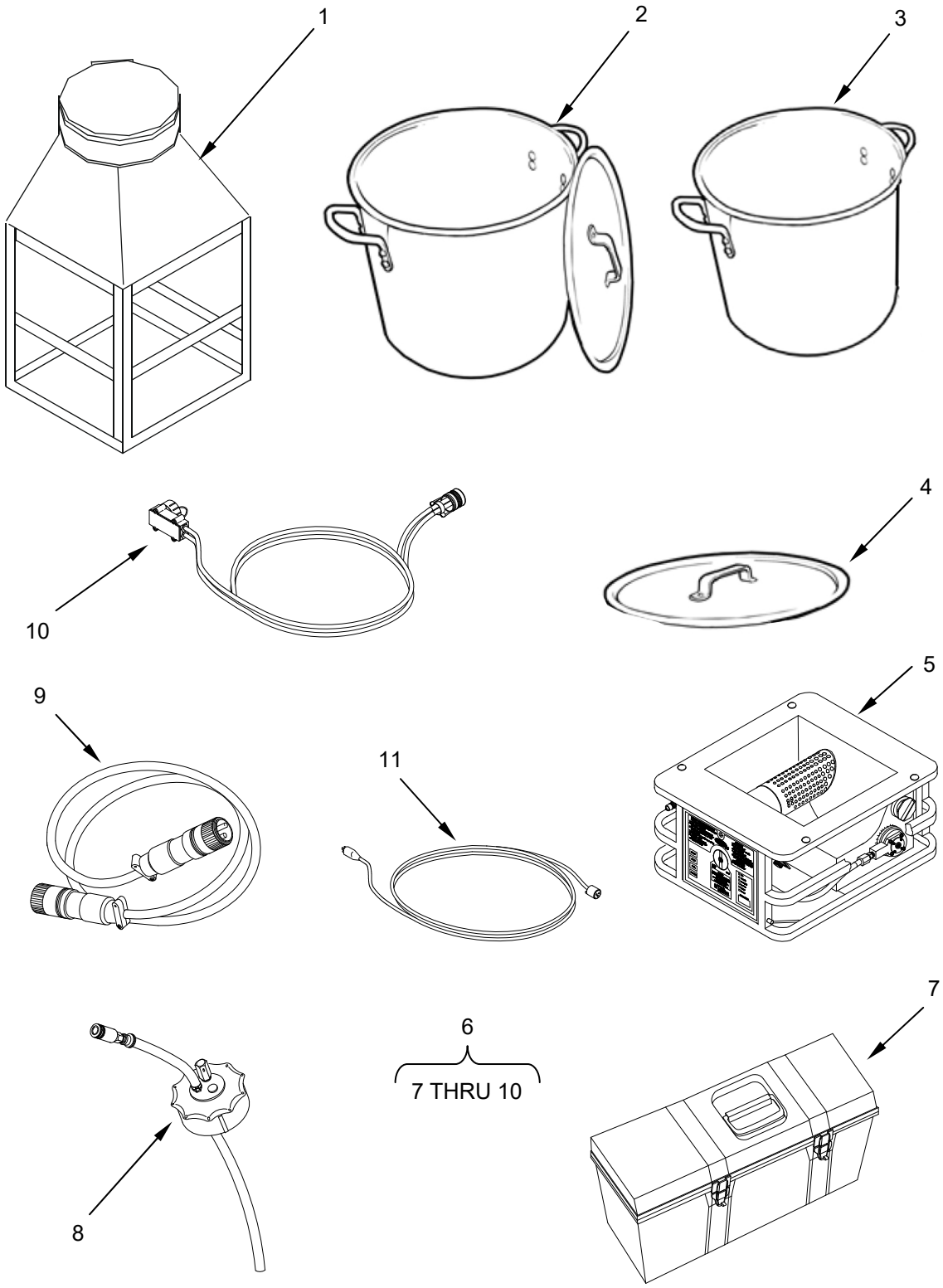


Figure 3. Cradle Assembly, Cooking Pot.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY	(8) MC QTY
					GROUP 02		
					FIG. 3 CRADLE ASSEMBLY, COOKING POT		
1	PAOZZ	7330-01-248-9964	81337	5-13-3991	CRADLE ASSEMBLY, COOKING POT	1	0
2	PAOZZ	7330-00-292-2307	81337	DWG NO. 2-9-120	. POT, COOKING, 60 QUARTS	1	0
3	PAOZZ	7330-00-292-2306	80244	DWG NO. 2-9-35	. POT, COOKING, 40 QUARTS	1	0
4	PAOZZ	7330-00-250-6300	81349	MIL-P-1735	COVER, COOKING POT, ROUND	1	0
5	PAOFF	7310-01-507-9310	81349	PD MBU-001	BURNER UNIT, MODERN V3	1	0
6	PAOOO	5180-01-565-2047	19207	DFP TRI-013	MBU ACCESSORY KIT	1	0
7	XDOOO		04AL0	7716	. ACCESSORY KIT BOX, STORAGE	1	0
8	PAOZZ	7310-01-455-3736	3AD06	MS0300	. FUEL ADAPTER, MBU	1	0
9	PAOZZ	7310-01-509-4493	3AD06	MS0105	. CORD, SHORT, MBU	1	0
10	PAOZZ	7310-01-455-0665	3AD06	MS0101	. CORD, LONG, MBU	1	0
11	PAOZZ	7310-01-454-1281	L4703	MSO400	. EXTENSION CORD, MBU	1	0
					END OF FIGURE		

OPERATOR AND FIELD MAINTENANCE

ANCILLARY EQUIPMENT

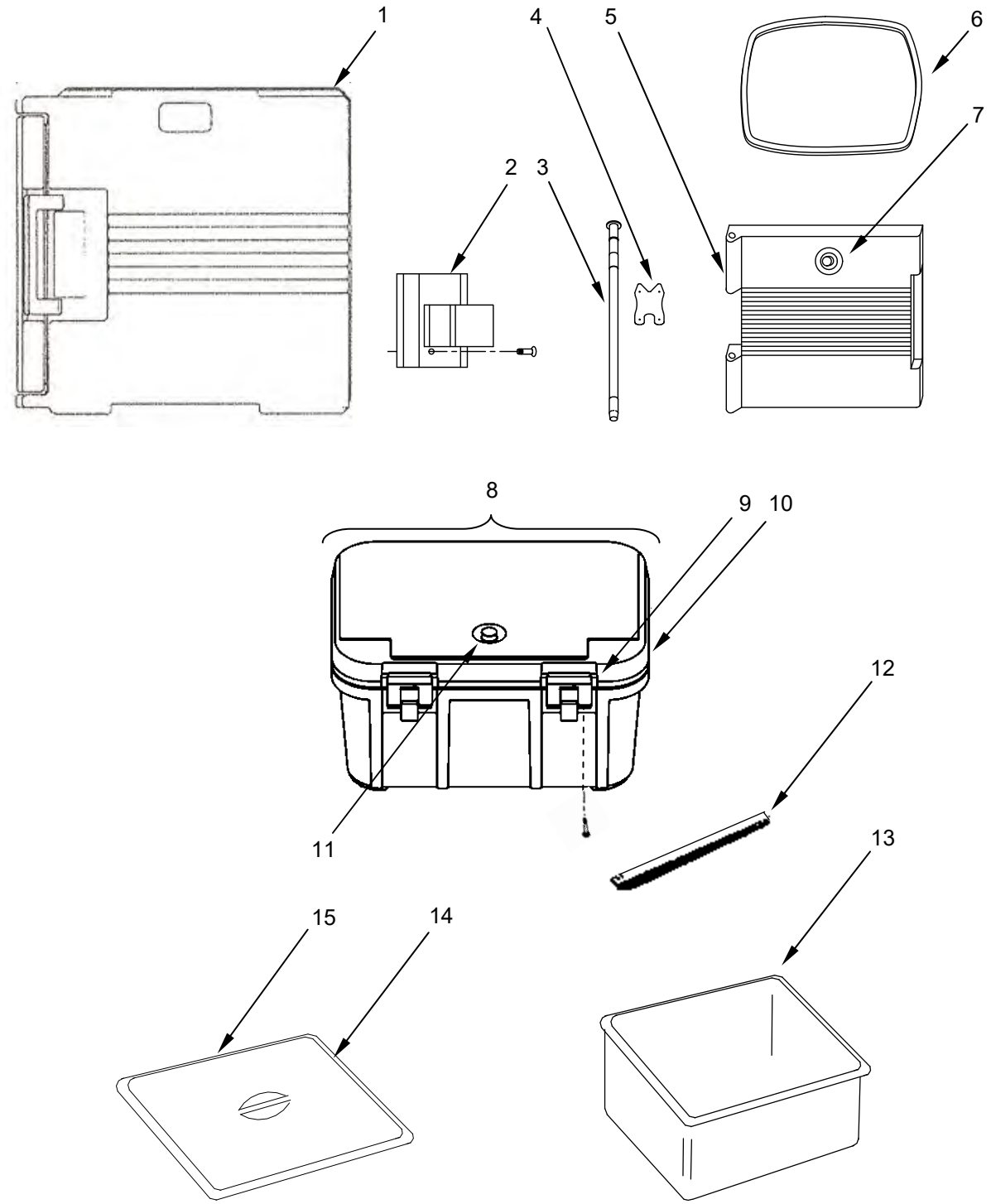


Figure 5. Ancillary Equipment (Sheet 1 of 3).

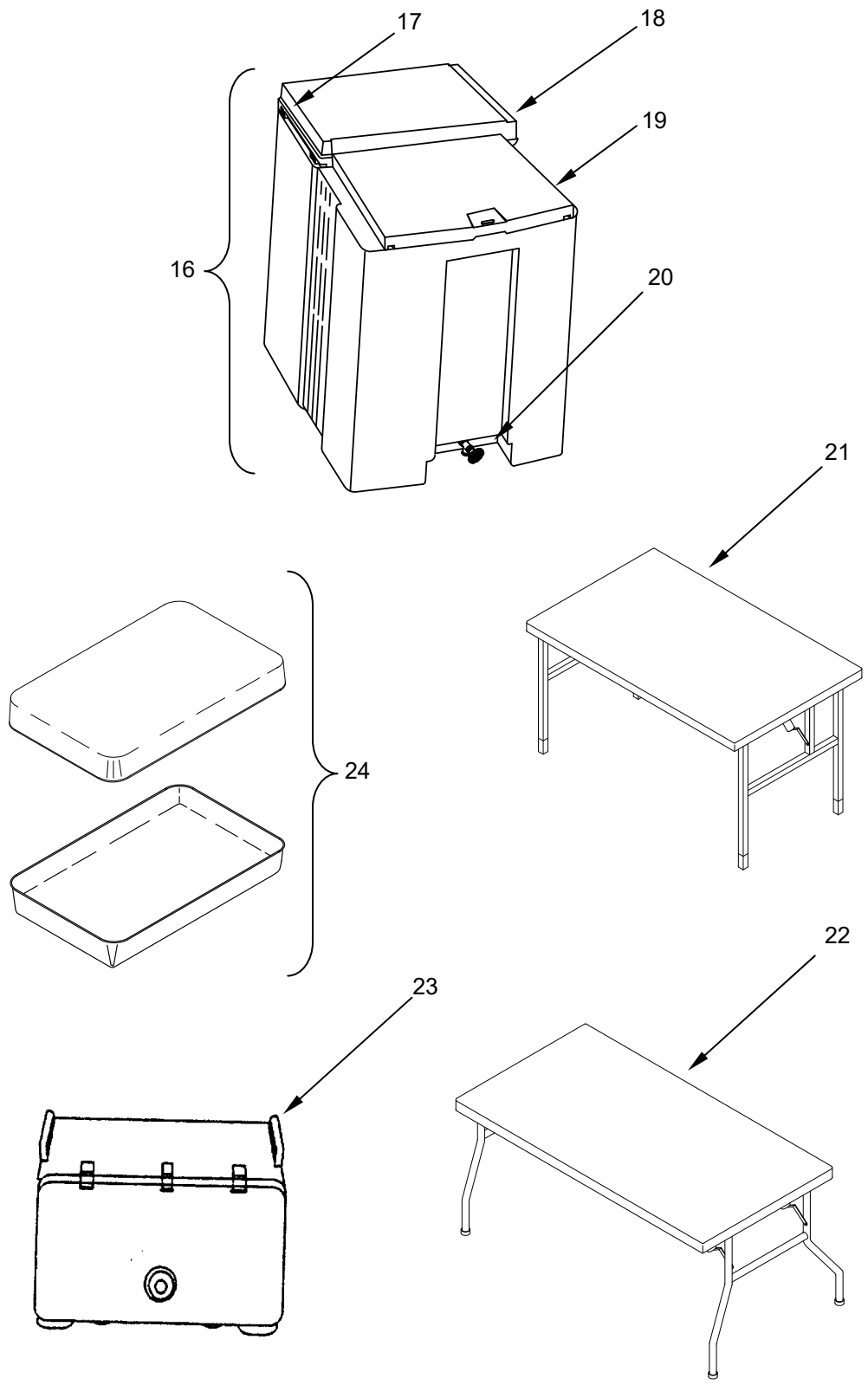


Figure 5. Ancillary Equipment (Sheet 2 of 3).

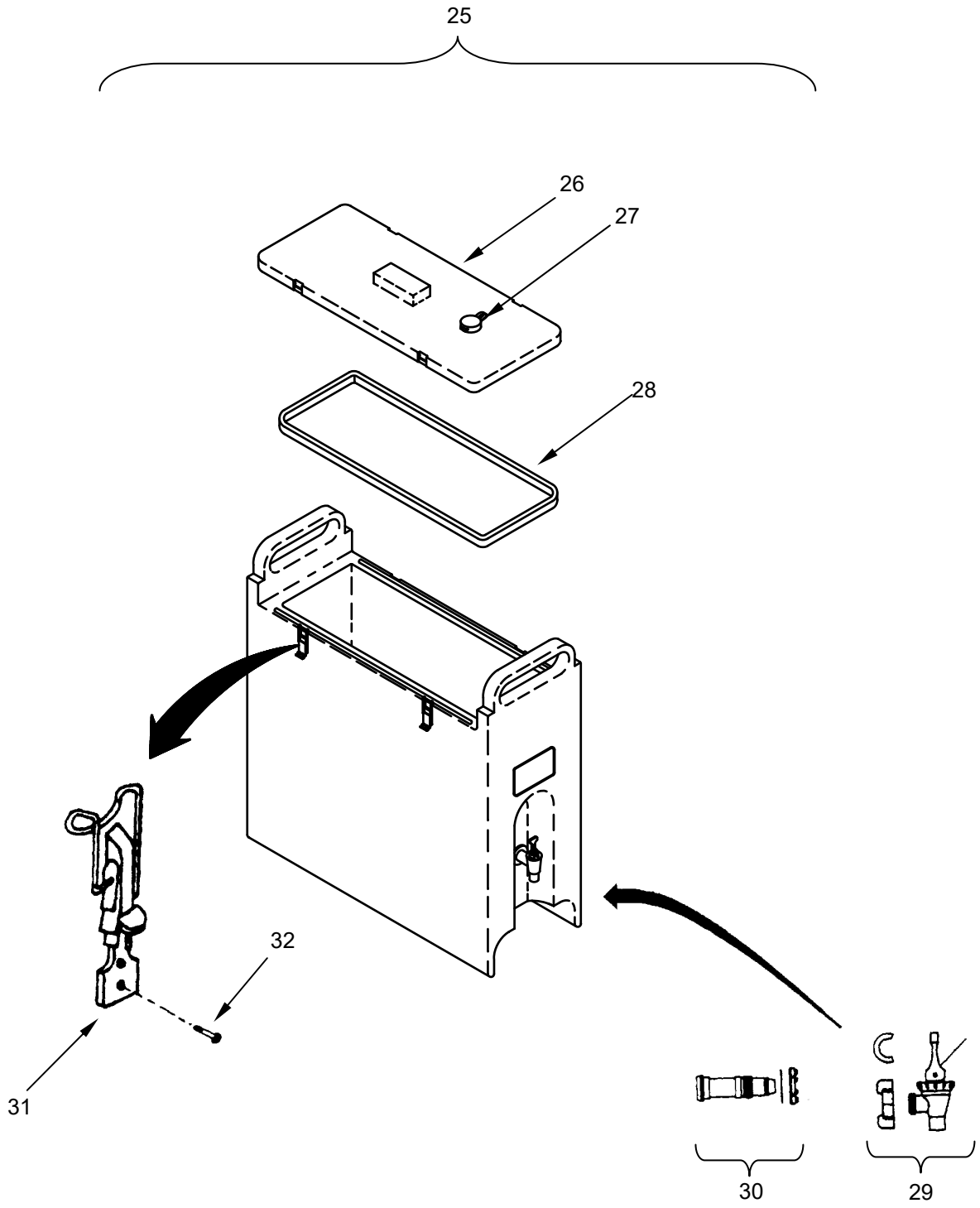


Figure 5. Ancillary Equipment (Sheet 3 of 3).

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY	(8) MC QTY
					GROUP 03		
					FIG. 4 ANCILLARY EQUIPMENT		
1	XDOOO		21669	UPC-400-403	FOOD CONTAINER, INSULATED (GREEN) (FWW)	3	0
1	XDOOO		21669	UPC-400-157	FOOD CONTAINER, INSULATED (TAN) (FXC)	3	0
2	XCOZZ		21669	60135	. LATCH WITH SCREWS	1	0
3	XCOZZ		21669	42132	. HINGE PIN, NYLON	2	0
4	XCOZZ		21669	42133	. LOCK CLIP, HINGE PIN	2	0
5	XDOZZ		21669	7335-403	. DOOR (GREEN) (FWW)	1	0
5	XDOZZ		21669	7335-157	. DOOR (TAN) (FXC)	1	0
6	XDOZZ		21669	12119	. . GASKET	1	0
7	PAOZZ	7320-01-213-6160	21669	14200	. . CAP, VENT, DISPENSER, LIQUID	1	0
8	PAOZZ	7360-01-419-8500	21669	UPCS-160PKG-403	FOOD TRANSPORTER, INSULATED, GREEN (FWW)	5	0
8	PAOZZ	7360-01-419-6261	58536	A-A-52193-1-3-1	FOOD TRANSPORTER, INSULATED, TAN (FXC)	5	0
9	XCOZZ		21669	60422	. LATCH WITH SCREWS	4	0
10	PAOZZ	7360-01-483-8549	21669	633513	. COVER, INSULATED (GREEN) (FWW)	1	0
10	PAOZZ	7360-01-483-8551	21669	63353	. COVER, INSULATED (TAN) (FXC)	1	0
11	PAOZZ	7320-01-213-6160	21669	14200	. . CAP, VENT, DISPENSER, LIQUID	1	0
12	PAOZZ	7360-01-470-1237	21669	DIV12WHITE	. . . DIVIDER BAR	2	0
13	PAOZZ	7360-01-465-4561	21669	43024	. .TRANSPORTOR PAN	3	0
14	PAOOO	7360-01-463-9027	21669	43025	. . FOOD TRANSPORTOR, PAN COVER	3	0
15	PAOZZ	7360-01-456-9114	21669	43026	. . . FOOD TRANSPORTOR, PAN COVER GASKETS	3	0
16	PAOOO	4110-01-452-7317	81337	A-A-52218-II2	CHEST, ICE STORAGE, GREEN (FWW)	1	0
16	PAOOO	4110-01-452-7315	81337	AA52218-II1	CHEST, ICE STORAGE, TAN, (FXC)	1	0
17	XDOZZ		21669	45238	. THUMBSCREW	2	0
18	XDOZZ		21669	7634-403	. LID, STATIONARY (GREEN) (FWW)	1	0
18	XDOZZ		21669	7634-157	. LID, STATIONARY (TAN) (FXC)	1	0
19	XCOZZ		21669	7635-403	. LID, SLIDE (GREEN) (FWW)	1	0
19	XDOZZ		21669	7635-157	. LID, SLIDE (TAN) (FXC)	1	0
20	XDOZZ		21669	60296	. THREADED FAUCET AND DRAIN ASSY	1	0

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY	(8) MC QTY
21	PAOZZ	7105-01-500-0012	81337	A-A-59102-1-E-2	TABLE, FOLDING LEGS (GREEN) (FWW)	3	0
21	XDOZZ		81337	A-A-59102-2-E-2	TABLE, FOLDING LEGS (TAN) (FXC	3	0
22	PAOZZ	7105-01-250-0086	81337	5-13-3751	TABLE, FOLDING LEGS (FXC)	0	3
23	PAOZZ	7330-01-234-2163	21669	200MPC1-G	FOOD CONTAINER INSULATED	0	3
24	PAOZZ	7310-01-533-8713	21669	KRN1113	FOOD COOKING AND SERVING W/LID	0	24
25	PAOOO	7310-01-245-6937	21669	500LCD-G	DISPENSER, LIQUID, INSULATED, GREEN (FWW)	6	6
25	PAOOO	7320-01-093-7371	0BXP3	7505	DISPENSER, LIQUID, INSULATED, TAN (FXC)	6	0
26	PAOOO	7320-01-255-8174	21669	63226-G	. LID ASSEMBLY, LIQUID, GREEN (FWW)	1	1
26	PAOOO	7320-01-223-9558	0VUJ2	639997	. COVER, TAN (FXC)	1	1
27	PAOZZ	7320-01-213-6160	21669	14200	. . CAP, VENT, DISPENSER	1	1
28	PAOZZ	5330-01-255-2588	21669	12101	. . GASKET	1	1
29	PAOZZ	7320-01-245-9048	21669	46002	. FAUCET ASSEMBLY	1	1
30	PAOZZ	7330-01-250-7730	21669	64003	. SPOUT ASSEMBLY, DISP	1	1
31	PAOZZ	5340-01-249-6786	21669	60028	. CATCH, FLUSH	4	4
32	PAOZZ	5305-00-497-7401	96906	MS51861-25C	. SCREW,TAPPING	8	8
					END OF FIGURE		

OPERATOR AND FIELD MAINTENANCE

HARDWARE AND CABLES

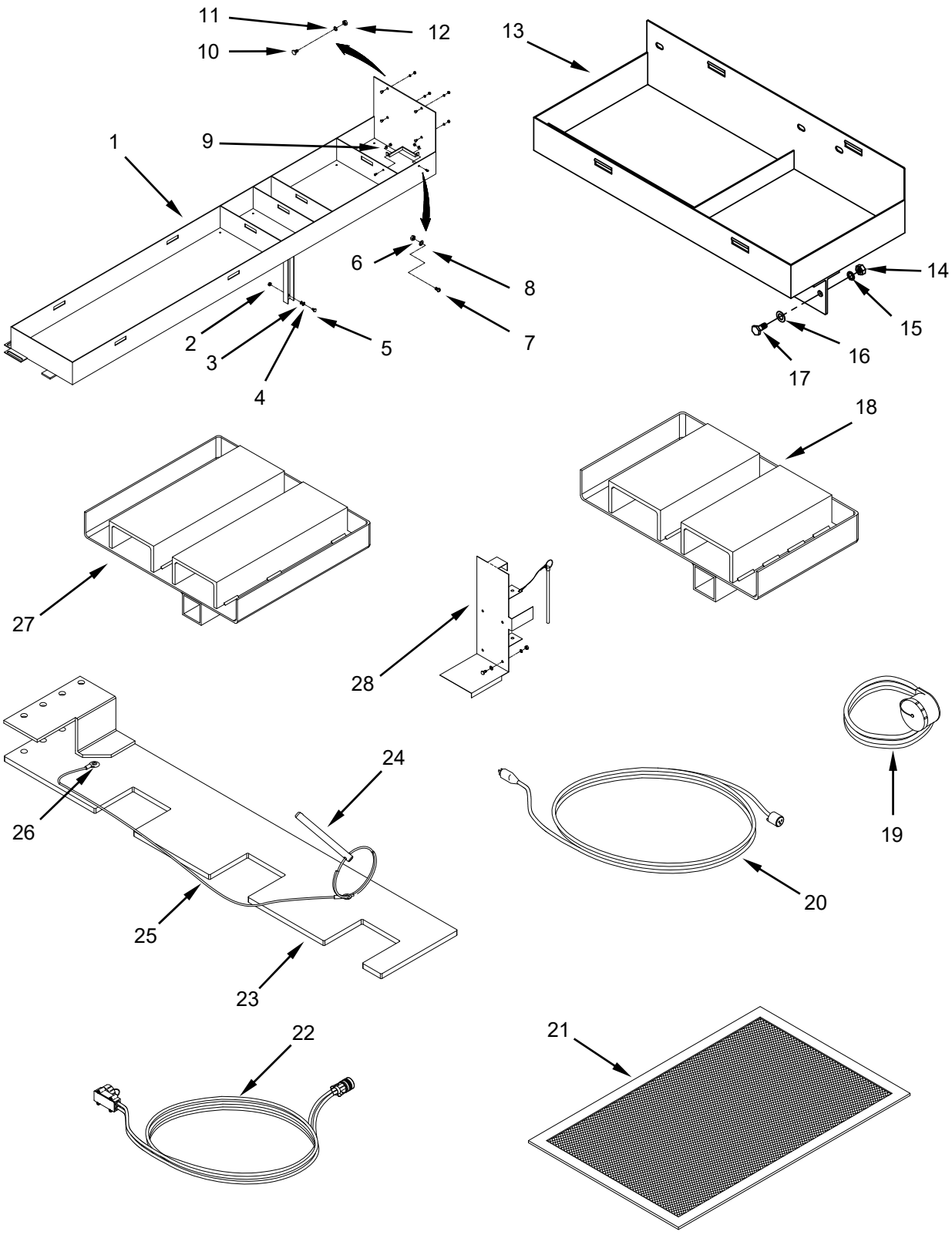


Figure 5. Hardware and Cables.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY	(8) MC QTY
					GROUP 04		
					FIG. 5 HARDWARE AND CABLES		
1	XCOZZ		81337	5-13-7647	. BRACKET, LTT, DRIVER SIDE	1	0
2	XCOZZ		2V507	91831A127	. . NUT, NYLON LOCKING, 1/4 -20	1	0
3	XCOZZ		2V507	96659A106	. . WASHER, FLAT, 1/4 IN	1	0
4	XCOZZ		2V507	91007A641	. . LOCK WASHER, 1/4 IN	1	0
5					DELETED		
6	XCOZZ		2V507	91831A127	. . NUT, NYLON LOCKING, 1/4 -20	2	0
7					DELETED		
8	XCOZZ		2V507	91007A641	. . LOCK WASHER, 1/4 IN	7	0
9	PAOZZ		81337	5-13-7790	. . L-BRACKET	1	0
10	XCOZZ		2V507	92240A542	. . SCREW, CAP, HEX HEAD, 1/4 – 20 X 1 IN	7	0
11	XCOZZ		2V507	92146A029	. . LOCK WASHER, 1/4 IN	7	0
12	XCOZZ		2V507	91831A127	. . NUT, NYLON LOCKING, 1/4 -20	7	0
13	PAOZZ		81337	5-13-7648	. BRACKET, LTT PASSENGER SIDE	1	0
14	XCOZZ		2V507	91831A127	. . NUT, NYLON LOCKING, 3/8 -16	5	0
15	XCOZZ		2V507	91007A641	. . LOCK WASHER, 3/8 IN	5	0
16	XCOZZ		2V507	96659A108	. . WASHER, FLAT, 3/8 IN	5	0
17	XCOZZ		2V507	92240A624	. . SCREW, CAP, HEX HEAD, 3/8 – 16 X 1 IN	5	0
18	PAOZZ	5340-01-492-6747	04AL0	HMV100	. BRACKET, MULTIPLE ANGLE	0	1
19	XDOZZ		3P0G5	ABCH-0596-20	. . POWER CABLE, 20 FT	1	0
20	XDOZZ		3P0G5	ABHSGB277MS	. . POWER CABLE, 6 FT	1	0
21					DELETED		
22	PAOZZ	7310-01-454-1241	81349	MILPRF44485	. NATO EXTENSION CABLE, 20 FT	1	0
23	PAOZZ	5340-01-492-6748	04AL0	HMV110	. BRACKET,MOUNTING	0	1
24	XCOZZ		2V507	94975A438	. . DETENT PIN W/LANYARD, 1/4 IN X 5 IN L	0	1
25	XCOZZ		2V507	94975A434	. . LANYARD	0	1
26	XCOZZ		2V507	97524A035	. . RIVET, BLIND, 3/16 IN DIA	0	1
27	PAOZZ	5340-01-492-6746	04AL0	HMV105	. BRACKET, MULTIPLE ANGLE	0	1
28	PAOZZ	5340-01-493-2502	04AL0	HMV117	. BRACKET, MOUNTING	0	1
					END OF FIGURE		

OPERATOR AND FIELD MAINTENANCE

NATIONAL STOCK NUMBER INDEX

STOCK NUMBER	FIG.	ITEM
5305-00-063-9610	1	7
5935-00-197-6556	1	6
7330-00-250-6300	3	4
5925-00-283-6048	1	5
7330-00-292-2306	3	3
7330-00-292-2307	3	2
5920-00-424-8873	1	41
5940-00-458-0060	1	31
5305-00-497-7401	4	32
7320-01-093-7371	4	25
5315-01-128-6802	1	15
4820-01-131-9521	1	54
5331-01-149-6629	2	40
5320-01-177-7940	1	49
5935-01-195-2337	1	8
5930-01-206-2693	1	3
7320-01-213-6160	4	7
	4	11
	4	27
4730-01-220-0026	1	17
7320-01-223-9558	4	26
4730-01-233-8396	1	53
7330-01-234-2163	4	23
7310-01-245-6937	4	25
7320-01-245-9048	4	29
7330-01-248-9964	3	1
5340-01-249-6786	4	31
7105-01-250-0086	4	22
7330-01-250-7730	4	30
5330-01-255-2588	4	28
7320-01-255-8174	4	26
5975-01-290-7638	1	34
4730-01-380-6025	1	18
7360-01-419-6261	4	8
7360-01-419-8500	4	8
2910-01-442-2875	2	28
6105-01-442-6342	2	18
5999-01-442-7643	1	4
7310-01-442-8340	1	20
5905-01-443-9038	1	23
5342-01-443-9361	1	43
4110-01-452-7315	4	16
4110-01-452-7317	4	16
7310-01-454-1241	5	22
7310-01-454-1281	3	11
7310-01-455-0665	3	10
5330-01-455-2315	1	50
7310-01-455-3736	3	8
7360-01-456-9114	4	15
5306-01-463-2101	1	46
7360-01-463-9027	4	14
7360-01-465-4561	4	13
7360-01-470-1237	4	12
7360-01-483-8549	4	10
7360-01-483-8551	4	10
5305-01-484-0936	2	10
4520-01-492-6662	2	48
5340-01-492-6700	2	33
4140-01-492-6709	2	20
5330-01-492-6731	2	21
5340-01-492-6739	1	11
	2	9
5340-01-492-6746	5	27
5340-01-492-6747	5	18
5340-01-492-6748	5	23
5930-01-492-7272	1	10
4310-01-492-8182	2	22
4310-01-492-8190	2	23
4710-01-492-8200	2	16
3010-01-492-8203	2	29
6150-01-492-8211	2	44
5930-01-492-9140	2	13
5365-01-492-9147	2	24
	2	38
4710-01-492-9150	2	39
4710-01-492-9160	2	17
4730-01-492-9241	1	19
5930-01-492-9245	1	35
7310-01-492-9254	1	39
7310-01-492-9267	2	46
7310-01-492-9271	2	31
7310-01-493-1726	2	12
4540-01-493-1729	2	41
5980-01-493-1761	2	14
7310-01-493-1765	2	42
6130-01-493-1792	1	40
7310-01-493-1801	2	2
4720-01-493-1828	1	58
4720-01-493-1830	1	21
7310-01-493-1832	1	42
4520-01-493-1836	1	55
5340-01-493-2135	1	28
5340-01-493-2154	1	30
5340-01-493-2184	1	52

STOCK NUMBER	FIG.	ITEM
5315-01-493-2189	1	51
7310-01-493-2193	1	2
7310-01-493-2195	1	48
5305-01-493-2214	1	44
5310-01-493-2243	1	45
5305-01-493-2282	2	32
	2	34
5310-01-493-2285	2	19
7310-01-493-2287	1	22
5305-01-493-2489	1	56
5340-01-493-2502	5	28
7105-01-500-0012	4	21
7310-01-507-9310	3	5
7310-01-509-4493	3	9
7310-01-514-1420	1	1
7360-01-514-1432	1	9
4530-01-533-2037	2	7
4140-01-533-2038	2	1

STOCK NUMBER	FIG.	ITEM
4140-01-533-2053	2	6
4810-01-533-2068	2	35
7310-01-533-2095	2	36
4810-01-533-4207	2	25
5330-01-533-4274	2	30
5331-01-533-4279	2	3
5331-01-533-4280	2	4
4720-01-533-4407	2	27
5340-01-533-4450	2	43
6150-01-533-4465	2	15
6150-01-533-4483	2	45
5331-01-533-4494	2	11
4010-01-533-4957	1	14
4730-01-533-8368	2	26
7310-01-533-8713	4	24
5180-01-565-2047	3	6
7360-01-570-9851	1	1

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PART NUMBER INDEX

PART NUMBER	FIG.	ITEM
01005309	2	26
01006219-0	2	8
01006327-0	2	40
12101	4	28
12119	4	6
13054541	1	15
14200	4	7
	4	11
	4	27
1492-F1	1	31
1492-N23	1	34
16/3SOJ/SOW	1	9
16-01	1	35
200MPC1-G	4	23
25795	1	46
2FA5473	1	3
42132	4	3
42133	4	4
43024	4	13
43025	4	14
43026	4	15
45238	4	17
46002	4	29
4C979-R2	1	43
500LCD-G	4	25
5-13-3751	4	22
5-13-3991	3	1
5-13-7647	5	1
5-13-7729	5	13
5-13-7790	5	9
5X716	1	54
60028	4	31
60135	4	2
60296	4	20
60422	4	9
60T21X-1236G	1	23
63226-G	4	26
633513	4	10
63353	4	10
639997	4	26
64003	4	30
7335-157	4	5
7335-403	4	5
73605T92	1	53
7505	4	25
7634-157	4	18
7634-403	4	18
7635-157	4	19
7635-403	4	19
7716	3	7
800H-FRXT QI0RD4	1	4
8623K144G	2	30
8694K67	1	50
8747105	1	59
8914385-6	1	7
90004155	1	49
90312A210	1	14
91007A641	5	4
	5	8
	5	15
91831A127	5	2
	5	6
	5	12
	5	14
	1	45
92000A220	2	10
92146A029	5	11
92210A583	1	44
92240A542	5	10
92240A624	5	17
9263K212	2	4
9263K238	2	3
94975A434	5	25
94975A438	5	24
96659A106	5	3
96659A108	5	16
97524A035	5	26
A-A-52193-1-3-1	4	8
AA52218-II1	4	16
A-A-52218-II2	4	16
A-A-59102-1-E-2	4	21
A-A-59102-2-E-2	4	21
AAA00007	2	27
ABCH-0596-20	5	19

PART NUMBER	FIG.	ITEM
ABHSGB277MS	5	20
AGC15	1	41
AK1630F	1	9
B42000-95-0001	1	20
B42000-95-0002	2	18
B42000-95-0004	2	22
B42000-95-0005	2	23
B42000-95-0007	2	16
B42000-95-0009	2	17
B42000-95-0010	2	28
B42000-95-0011	2	29
B42000-95-0014	2	44
B42000-95-0016	2	42
B42000-95-0017	2	41
B42000-95-0018	2	14
B42000-95-0021	2	2
B42000-95-0022	1	11
B42000-95-0022	2	9
B42000-95-0026	2	39
B42000-95-0027	2	46
B42000-95-0027G	2	47
B42000-95-0028	2	48
B42000-95-0029	2	12
B42000-95-0031	2	33
B42000-95-0035	2	31
B42000-95-0037	2	13
B42000-95-0038	2	20
B42000-95-0040	2	32
	2	34
B42000-95-0044	2	24
	2	38
B42000-95-0045	2	19
B42000-98-0020	2	1
B42005-04-0006	2	35
B42005-04-0013	2	25
B42005-04-0023	2	6
B42005-04-0024	2	7
B42005-04-0024G	2	11
B42005-04-0025	2	36
B42005-04-0025G	2	37
B42005-95-0003	2	21
B42005-95-0016S	2	43
B42005-95-0018C	2	15
B42005-98-002C	2	45
B-QC4-B1-400K1	1	17

PART NUMBER	FIG.	ITEM
B-QC4-D-4HC	1	18
DFP TRI-013	3	6
DIV12WHITE	4	12
DUI-24/ 300Q	1	40
DWG NO. 2-9-120	3	2
DWG NO. 2-9-35	3	3
HMV100	5	18
HMV105	5	27
HMV110	5	23
HMV117	5	28
HMV500	1	55
KRN1113	4	24
MIL-P-1735	3	4
MILPRF44485	5	22
MS0101	3	10
MS0105	3	9
MS0300	3	8
MSO400	3	11
MS3181-12CA	1	8
MS51861-25C	4	32
PD MBU-001	3	5
PTO2E–12–3P	1	6
PTO2E-12-3S	1	6
S10-32RC	1	56
TOS-12C-LI	1	10
TRH 2000	1	1
TRH 2050	1	2
TRH AK1008	1	2
TRH AKB31008	1	1
TRH1201B	1	28
TRH1260	1	30
TRH1313	1	19
TRH1314	1	22
TRH2020	1	48
TRH914	1	42
TRH928A	1	52
TRH928D	1	51
TRH931	1	39
TRH-FLA-001	1	21
TRH-FLT-001	1	58
UPC-400-157	4	1
UPC-400-403	4	1
UPCS-160PKG-403	4	8
W58-XBIA4A-5	1	5

CHAPTER 10

SUPPORTING INFORMATION FOR ASSAULT KITCHEN

SCOPE

This Work Package lists all field manuals, forms, technical manuals and miscellaneous publications referenced throughout this manual.

ARMY REGULATIONS

AR 30-22	The Army Food Service Program
AR 420-55	Food Service and Related Equipment
AR 700-15	Packaging of Materiel
AR 735-11-2	Reporting of Supply Discrepancies
AR 750-1	Army Material Maintenance Policy
AR 750-10	Army Modification Program

DA PAMPHLETS

DA PAM 25-30	Consolidated Index of Army Publications and Blank Forms
DA PAM 30-22	The Army Food Service Program
DA PAM 750-8	The Army Maintenance Management System (TAMMS) Users Manual

FIELD MANUALS

FM 10-23	Basic Doctrine For Army Field Feeding And Class I Operations Management
FM 3-3	Chemical and Biological Contamination Avoidance
FM 3-5	NBC Decontamination
FM 38-701	Packaging of Materials, Packing
FM 4-25.11 (FM 21-11)	First Aid for Soldiers

FORMS

DA Form 2404	Equipment Inspection & Maintenance Worksheet
DA Form 5988	Equipment Inspection & Maintenance Worksheet
DD 361	Transportation Discrepancy Report
SF 364	Report of Discrepancy (ROD)
SF 368	Product Quality Deficiency Report (PQDR)

MARINE CORPS PAMPHLETS

MCRP 4-11.8A	Marine Corps Field Feeding Program

TECHNICAL BULLETINS

TB 43-0002-22	Maintenance Expenditure Limits for FSC Group 73; FSC Classes 7310, 7320, 7330, and 7360
TB 10-7310-203-23	M1101 and M1102 Trailer Modification

TECHNICAL MANUALS

TM 10-7310-281-13&P	Operator's, Unit, and Direct Support Maintenance Manual, Including Repair Parts and Special Tools List (RPSTL) for Modern Burner Unit (MBU) NSN 7310-01-452-8137 and Modern Burner Unit (MBU-V3) NSN 7310-01-507-9310
TM 4700-15/1	Equipment Maintenance Forms and Procedures
TM 7350-244-3	Procedures for Destruction of Equipment to Prevent Enemy Use

END OF WORK PACKAGE

OPERATOR AND FIELD MAINTENANCE

MAINTENANCE ALLOCATION CHART (MAC)

MAINTENANCE ALLOCATION CHART

INTRODUCTION

The Army Maintenance System MAC

This introduction provides a general explanation of all maintenance and repair functions authorized at the two maintenance levels under the Two-Level Maintenance System concept.

The MAC (immediately following the introduction) designates overall authority and responsibility for the performance of maintenance functions on the identified end item or component. The application of the maintenance functions to the end item or component shall be consistent with the capacities and capabilities of the designated maintenance levels, which are shown on the MAC in column (4) as:

Field – includes three subcolumns, Crew (C), Service (O), and Field (F).

Sustainment – includes two subcolumns, Below Depot (H) and Depot (D)

The maintenance to be performed below depot and in the field is described as follows:

1. Service maintenance. The responsibility of a using organization to perform maintenance on its assigned equipment. It normally consists of inspecting, servicing, lubricating, adjusting, and replacing parts, minor assemblies, and subassemblies. The replace function for this level of maintenance is indicated by the letter "O" in the third position of the SMR code. An "O" appearing in the fourth position of the SMR code indicates complete repair is possible at the service maintenance level. The tools and test equipment requirements (immediately following the MAC) list the tools and test equipment (both special tools and common tool sets) required for each maintenance function as referenced from the MAC.

2. Field maintenance. Maintenance accomplished on a component, accessory, assembly, subassembly, plug-in unit, or other portion either on the system or after it is removed. The replace function for this level of maintenance is indicated by the letter "F" appearing in the third position of the SMR code. An "F" appearing in the fourth position of the SMR code indicates complete repair is possible at the field maintenance level. Items are returned to the user after maintenance is performed at this level.

3. Below depot sustainment. Maintenance accomplished on a component, accessory, assembly, subassembly, plug-in unit, or other portion either on the system or after it is removed. The replace function for this level of maintenance is indicated by the letter "H" appearing in the third position of the SMR code. An "H" appearing in the fourth position of the SMR code indicates complete repair is possible at the below depot sustainment maintenance level. Items are returned to the supply system after maintenance is performed at this level.

The tools and test equipment requirements table (immediately following the MAC) lists the tools and test equipment (both special tools and common tool sets) required for each maintenance function as referenced from the MAC.

The remarks (immediately following the tools and test equipment requirements) contain supplemental instructions and explanatory notes for a particular maintenance function.

Maintenance Functions

Maintenance functions are limited to and defined as follows:

1. Inspect. To determine the serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination (e.g., by sight, sound, or

feel). This includes scheduled inspection and gagings and evaluation of cannon tubes.

2. Test. To verify serviceability by measuring the mechanical, pneumatic, hydraulic, or electrical characteristics of an item and comparing those characteristics with prescribed standards on a scheduled basis, i.e., load testing of lift devices and hydrostatic testing of pressure hoses.

3. Service. Operations required periodically to keep an item in proper operating condition, e.g., to clean (includes decontaminate, when required), to preserve, to drain, to paint, or to replenish fuel, lubricants, chemical fluids, or gases. This includes scheduled exercising and purging of recoil mechanisms. The following are examples of service functions:

   a. Unpack. To remove from packing box for service or when required for the performance of maintenance operations.

   b. Repack. To return item to packing box after service and other maintenance operations.

   c. Clean. To rid the item of contamination.

   d. Touch up. To spot paint scratched or blistered surfaces.

   e. Mark. To restore obliterated identification.

4. Adjust. To maintain or regulate, within prescribed limits, by bringing into proper position, or by setting the operating characteristics to specified parameters.

5. Align. To adjust specified variable elements of an item to bring about optimum or desired performance

6. Calibrate. To determine and cause corrections to be made or to be adjusted on instruments of test, measuring, and diagnostic equipment used in precision measurement. Consists of comparisons of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.

7. Remove/Install. To remove and install the same item when required to perform service or other maintenance functions. Install may be the act of emplacing, seating, or fixing into position a spare, repair part, or module (component or assembly) in a manner to allow the proper functioning of an equipment or system.

8. Paint (Ammunition Only). To prepare and spray color coats of paint so that the ammunition can be identified and protected. The color indicating primary use is applied, preferably, to the entire exterior surface as the background color of the item. Other markings are to be repainted as original so as to retain proper ammunition identification.

9. Replace. To remove an unserviceable item and install a serviceable counterpart in its place. “Replace” is authorized by the MAC and assigned maintenance level is shown as the third position code of the Source, Maintenance and Recoverability (SMR) code.

10. Repair. The application of maintenance services, including fault location/troubleshooting, removal/installation, disassembly/assembly procedures and maintenance actions to identify troubles and restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), end item, or system.

NOTE

The following definitions are applicable to the “repair” maintenance function:

Services. Inspect, test, service, adjust, align, calibrate, and/or replace.

Fault location/troubleshooting. The process of investigating and detecting the cause of

equipment malfunctioning; the act of isolating a fault within a system or Unit Under Test (UUT).

Disassembly/assembly. The step-by-step breakdown (taking apart) of a spare/functional group coded item to the level of its least component, that is assigned an SMR code for the level of maintenance under consideration (i.e., identified as maintenance significant).

Actions. Welding, grinding, riveting, straightening, facing, machining, and/or resurfacing.

11. Overhaul. That maintenance effort (service/action) prescribed to restore an item to a completely serviceable/operational condition as required by maintenance standards in appropriate technical publications. Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like new condition.

12. Rebuild. Consists of those services/actions necessary for the restoration of unserviceable equipment to a like new condition in accordance with original manufacturing standards. Rebuild is the highest degree of material maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (e.g., hours/miles) considered in classifying Army equipment/components.

Explanation of Columns in the MAC

Column (1) Group Number. Column (1) lists Functional Group Code (FGC) numbers, the purpose of which is to identify maintenance significant components, assemblies, subassemblies, and modules with the Next Higher Assembly (NHA).

Column (2) Component/Assembly. Column (2) contains the item names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

Column (3) Maintenance Function. Column (3) lists the functions to be performed on the item listed in column (2). (For a detailed explanation of these functions refer to “Maintenance Functions” outlined above).

Column (4) Maintenance Level. Column (4) specifies each level of maintenance authorized to perform each function listed in column (3), by indicating work time required (expressed as manhours in whole hours or decimals) in the appropriate subcolumn. This work time figure represents the active time required to perform that maintenance function at the indicated level of maintenance. If the number or complexity of the tasks within the listed maintenance function varies at different maintenance levels, appropriate work time figures are to be shown for each level. The work time figure represents the average time required to restore an item (assembly, subassembly, component, module, end item, or system) to a serviceable condition under typical field operating conditions. This time includes preparation time (including any necessary disassembly/assembly time), troubleshooting/fault location time, and quality assurance time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the MAC. The symbol designations for the various maintenance levels are as follows:

Field:

C Crew maintenance
O Service maintenance
F Field maintenance

Sustainment:

L Specialized Repair Activity (SRA)
H Below depot maintenance
D Depot maintenance

NOTE

The “L” maintenance level is not included in column (4) of the MAC. Functions to this level of maintenance are identified by work time figure in the “H” column of column (4), and an associated reference code is used in the REMARKS column (6). This code is keyed to the remarks and the SRA complete repair application is explained there.

Column (5) Tools and Equipment Reference Code. Column (5) specifies, by code, those common tool sets (not individual tools), common Test, Measurement and Diagnostic Equipment (TMDE), and special tools, special TMDE, and special support equipment required to perform the designated function. Codes are keyed to the entries in the tools and test equipment table.

Column (6) Remarks Code. When applicable, this column contains a letter code, in alphabetic order, which is keyed to the remarks table entries.

Explanation of Columns in the Tools and Test Equipment Requirements

Column (1) – Tool or Test Equipment Reference Code. The tool or test equipment reference code correlates with a code used in column (5) of the MAC.

Column (2) – Maintenance Level. The lowest level of maintenance authorized to use the tool or test equipment.

Column (3) – Nomenclature. Name or identification of the tool or test equipment.

Column (4) – National Stock Number (NSN). The NSN of the tool or test equipment.

Column (5) – Tool Number. The manufacturer's part number.

Explanation of Columns in Remarks

Column (1) – Remarks Code. The code recorded in column (6) of the MAC.

Column (2) – Remarks. This column lists information pertinent to the maintenance function being performed as indicated in the MAC.

OPERATOR AND FIELD MAINTENANCE

ASSAULT KITCHEN
MAINTENANCE ALLOCATION CHART (MAC)

Table 1. Maintenance Allocation Chart for Assault Kitchen.

(1)	(2)	(3)	(4) MAINTENANCE LEVEL					(5)	(6)
			FIELD			SUSTAINMENT			
GROUP NUMBER	COMPONENT/ ASSEMBLY	MAINTENANCE FUNCTION	CREW	SERVICE	FIELD	BELOW DEPOT	DEPOT	TOOLS AND EQUIPMENT REF CODE	REMARKS CODE
			C	O	F	H	D		
00	ASSAULT KITCHEN								
01	TRAY RATION HEATER	Inspect	.1						
0101	ASSEMBLY, TANK	Inspect	.1						
		Service	.2						B
		Repair	.1		.6			1,3,4,5,6	
010101	FLANGE MOUNT	Replace		.1				1,3	D
0102	SYSTEM, FUEL DELIVERY	Inspect	.1						
010201	LINE, FUEL	Inspect	.1						
010202	ADAPTER KIT, GRAVITY FEED	Inspect	.1						
		Replace	.2					1,3,4,5	
010203	FILTER ELEMENT, FLUID	Inspect	.1						
		Replace	.2					1,3,4,5	
0103	SYSTEM, ELECTRICAL	Inspect	.1						
010301	SWITCH, TOGGLE	Replace		.2				1,3,4,5	
010302	LIGHT SWITCH, PUSH-PULL	Repair		.1				1,3,4,5	
		Replace		.2				1,3,4,5	
010303	CIRCUIT BREAKER	Replace		.2				1,3,4,5	
010304	CONNECTOR, ELECTRICAL	Replace		.2				1,3,4,5	
010305	TERMINAL JUNCTION BLOCK	Replace		.2				1,3,4,5	
010306	LIQUID LEVEL SWITCH	Replace		.2				1,3,4,5	
010307	PROBE, MARTRON SENSOR	Replace		.2				1,3,4,5	

Table 1. Maintenance Allocation Chart for Assault Kitchen.

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL					(5) TOOLS AND EQUIPMENT REF CODE	(6) REMARKS CODE
			FIELD			SUSTAINMENT			
			CREW	SERVICE	FIELD	BELOW DEPOT	DEPOT		
			C	O	F	H	D		
010308	MERCURY TILT SWITCH	Replace		.2				1,3,4,5	
010309	RESISTOR, THERMAL	Replace		.2				1,3,4,5	
0104	RACK, TRAY RATION	Inspect	.1						
		Service	.1						B
		Repair			.3			6	
		Replace	.1						
0105	INVERTER, POWER STATIC	Inspect	.1						
		Test		.1					
		Repair		.1				1,3,4,5	
0106	LINE, POWER	Inspect	.1						
		Replace	.1						
0107	SKIDS	Inspect	.1						
		Replace		.2				1,3,4,5	
0108	SHOCK MOUNT	Replace		.3				1,3,4,5	
0109	ASSEMBLY, LID	Inspect	.1						
		Repair			.3			5	
		Replace	.1					1,3	
		Adjust	.1					1,3	
0110	ADAPTER, STRAIGHT, PIPE TO HOSE	Inspect	.1						
		Service	.1						C
		Replace	.2					1,2,3	
0111	VALVE, BALL	Service	.1						
		Replace	.2					1,2,3	
0112	PIPE, EXHAUST	Inspect	.1						
		Service	.1						C
		Replace	.1						
0113	BURNER, MULTI-FUEL	Inspect	.2						
		Repair		.2				1,3,4,5	
		Replace	.4					1,3	
		Test		.2				1,3,4,5	
011301	CONTROL, FLAME SAFEGUARD	Inspect	.1						
		Replace	.2					1,3	
011302	FILTER ELEMENT, INTAKE AIR	Replace		.1				1,3,4,5	

Table 1. Maintenance Allocation Chart for Assault Kitchen.

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL					(5) TOOLS AND EQUIPMENT REF CODE	(6) REMARKS CODE
			FIELD			SUSTAINMENT			
			CREW	SERVICE	FIELD	BELOW DEPOT	DEPOT		
			C	O	F	H	D		
011303	PUMP, FUEL	Repair		.2				1,3,4,5	
		Replace		.2				1,3,4,5	
011304	SEMICONDUCTOR DEVICE, PHOTO	Replace	.1						
011305	ATOMIZING CHAMBER	Repair		.3				1,3,4,5	
		Replace		.2				1,3,4,5	
011306	FUEL SUMP	Replace		.1				1,3,4,5	
02	CRADLE ASSEMBLY, COOKING POT	Inspect	.1						
		Service	.2						B
0201	BURNER UNIT, MODERN V3								A
0202	POT, COOKING	Inspect	.1						
		Service	.2						B
0203	POT, COOKING	Inspect	.1						
		Service	.2						B
0204	COVER, COOKING POT, ROUND	Inspect	.1						
		Service	.2						B
03	EQUIPMENT, ANCILLARY								
0301	TABLE, FOLDING LEGS	Inspect	.1						
		Service	.2						B
0302	FOOD CONTAINER, INSULATED	Inspect	.1						
		Service	.2						B
		Repair	.1					1,3	
0303	FOOD TRANSPORTER, INSULATED	Inspect	.1						
		Service	.2						B
		Repair	.1					1,3	
0304	CHEST, ICE STORAGE	Inspect	.1						
		Service	.2						B
		Repair	.1					1,3	

Table 1. Maintenance Allocation Chart for Assault Kitchen.

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL					(5) TOOLS AND EQUIPMENT REF CODE	(6) REMARKS CODE
			FIELD			SUSTAINMENT			
			CREW	SERVICE	FIELD	BELOW DEPOT	DEPOT		
			C	O	F	H	D		
0305	DISPENSER, LIQUID INSULATED	Inspect	.1						
		Service	.2						B
		Repair	.2					1,3	
04	HARDWARE AND CABLES	Inspect		.1					
		Replace		.2				4	

Table 2. Tools and Test Equipment for Assault Kitchen.

TOOLS OR TEST EQUIPMENT	MAINTENANCE LEVEL	NOMENCLATURE	NATIONAL STOCK NUMBER	TOOL NUMBER
1	O, C	Maintenance Kit (included within the TRH Maintenance Kit)	7360-01-514-1440	TRHMKT
2	O	Pliers, Slip-Joint (Located inside HMMWV tool bag)	5120-00-223-7397	11655775-3
3	O, C	Tool Kit (included inside the black metallic tool box)		
4	O	Tool Kit, General Mechanic's: Automotive (GMTK)	5180-01-483-0249	SC 5180-95-B47
5	O, F	Tool Set, SATS, Base	4910-01-490-6453	SC 4910-95-A81
6	O, F	Welding Machine, Arc (TIG) (LIN 47707)	3431-00-235-4728	903 220

Table 3. Remarks for Assault Kitchen.

REMARK CODE	REMARKS
A	Refer to TM 10-7310-281-13&P; Operator's, Unit, and Direct Support Maintenance Manual, Including Repair Parts and Special Tools List (RPSTL) for Modern Burner Unit (MBU) NSN 7310-01-452-8137 and Modern Burner Unit (MBU-V3) NSN 7310-01-507-9310 for Maintenance Procedures.
B	Service of equipment refers to cleaning with hot soapy water and/or abrasive cleaning pad to remove mineral residue, dirt, debris, and/or food particles.
C	Service of equipment refers to cleaning and/or clearing of obstructions.
D	Flange Mount should only be encountered on Marine Corps procured Tanks.

END OF WORK PACKAGE

OPERATOR AND FIELD MAINTENANCE

ASSAULT KITCHEN
COMPONENTS OF END ITEM (COEI) AND BASIC ISSUE ITEMS (BII) LISTS

INTRODUCTION

Scope

This work package lists COEI and BII for the Assault Kitchen (AK) to help you inventory items for safe and efficient operation of the equipment.

General

The COEI and BII information is divided into the following lists:

Components of End Item (COEI). This list is for information purposes only and is not authority to requisition replacements. These items are part of the Assault Kitchen. As part of the end item, these items must be with the end item whenever it is issued or transferred between property accounts. Items of COEI are removed and separately packaged for transportation or shipment only when necessary. Illustrations are furnished to help you find and identify the items.

Basic Issue Items (BII). These essential items are required to place the Assault Kitchen (AK) in operation, operate it, and to do emergency repairs. Although shipped separately packaged, BII must be with the Assault Kitchen (AK) during operation and when it is transferred between property accounts. Listing these items is your authority to request/requisition them for replacement based on authorization of the end item by the TOE/MTOE. Illustrations are furnished to help you find and identify the items.

Explanation of Columns in the COEI List and BII List

Column (1) Illus Number. Gives you the number of the item illustrated.

Column (2) National Stock Number (NSN). Identifies the stock number of the item to be used for requisitioning purposes.

Column (3) Description, Part Number/(CAGEC). Identifies the Federal item name (in all capital letters) followed by a minimum description when needed. The stowage location of COEI and BII is also included in this column. The last line below the description is the CAGEC (Commercial and Government Entity Code) (in parentheses) and the part number.

Column (4) Usable On Code. When applicable, gives you a code if the item you need is not the same for different models of equipment. These codes are identified below:

Code	Used on
FWW	Assault Kitchen, Green
FXC	Assault Kitchen, Tan

Column (5) Unit of Issue (U/I). Indicates the physical measurement or count of the item as issued per the National Stock Number shown in column (2).

Column (6) Qty Rqr. Indicates the quantity required.

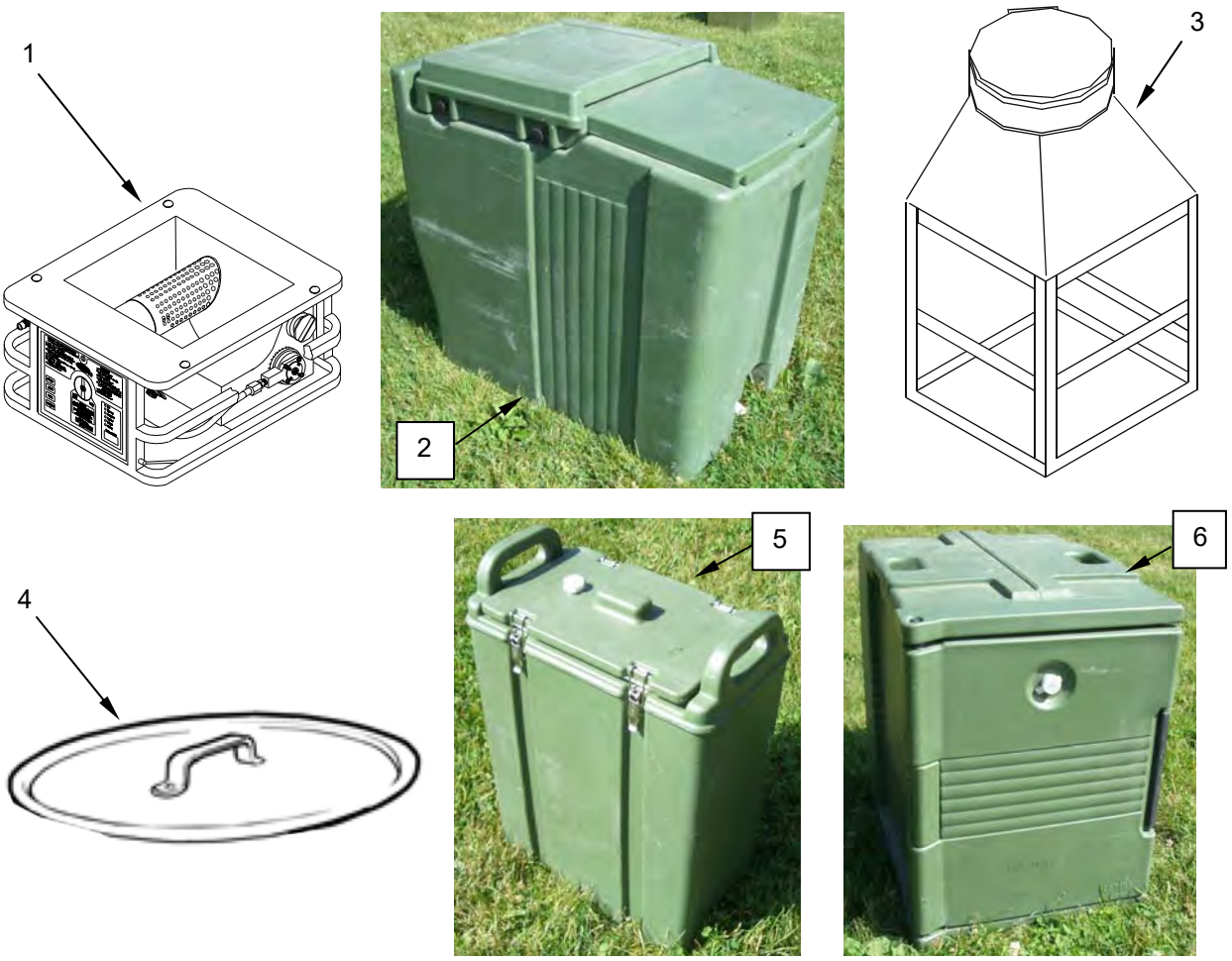


Table 1. Components Of End Item (COEI) List.

(1) Illus Number	(2) National Stock Number (NSN)	(3) Description, Part Number/(CAGEC)	(4) Usable On Code	(5) U/I	(6) Qty Rqr.
1	7310-01-507-9310	BURNER UNIT, MODERN V3 (ARMY ONLY) (in stockpot cradle)PD MBU-001 (81349)		EA	1
2	4110-01-452-7317	CHEST, ICE STORAGE, GREEN (in HMMWV or LTT cargo bed) A-A-52218-II2 (81337)	FWW	EA	1
2	4220-01-452-7315	CHEST, ICE STORAGE, TAN (in HMMWV or LTT cargo bed) A-A-52218-II1 (81337)	FXC	EA	1
3	7330-01-248-9964	CRADLE ASSEMBLY, COOKING POT (ARMY ONLY) (in HMMWV or LTT cargo bed) 5-13-3991 (81337)		EA	1
4	7330-00-250-6300	COVER, COOKING POT, ROUND (in stockpot cradle) MIL-P-1735 (81349)		EA	1
5	7310-01-245-6937	DISPENSER, LIQUID, INSULATED, GREEN, 5 gallon (in HMMWV or LTT cargo bed) A52190-2-2 (58536)	FWW	EA	6
5	7320-01-093-7371	DISPENSER, LIQUID, INSULATED, TAN, 5 gallon (in HMMWV or LTT cargo bed) 7505 (0BXP3)	FXC	EA	6
6	7330-01-520-7960	FOOD CONTAINER, INSULATED, GREEN (in HMMWV or LTT cargo bed) UPC-400 (21669)	FWW	EA	3
6	7330-01-234-2163	FOOD CONTAINER, INSULATED, TAN (in HMMWV or LTT cargo bed) 200MPC1-G (21669)	FXC	EA	3

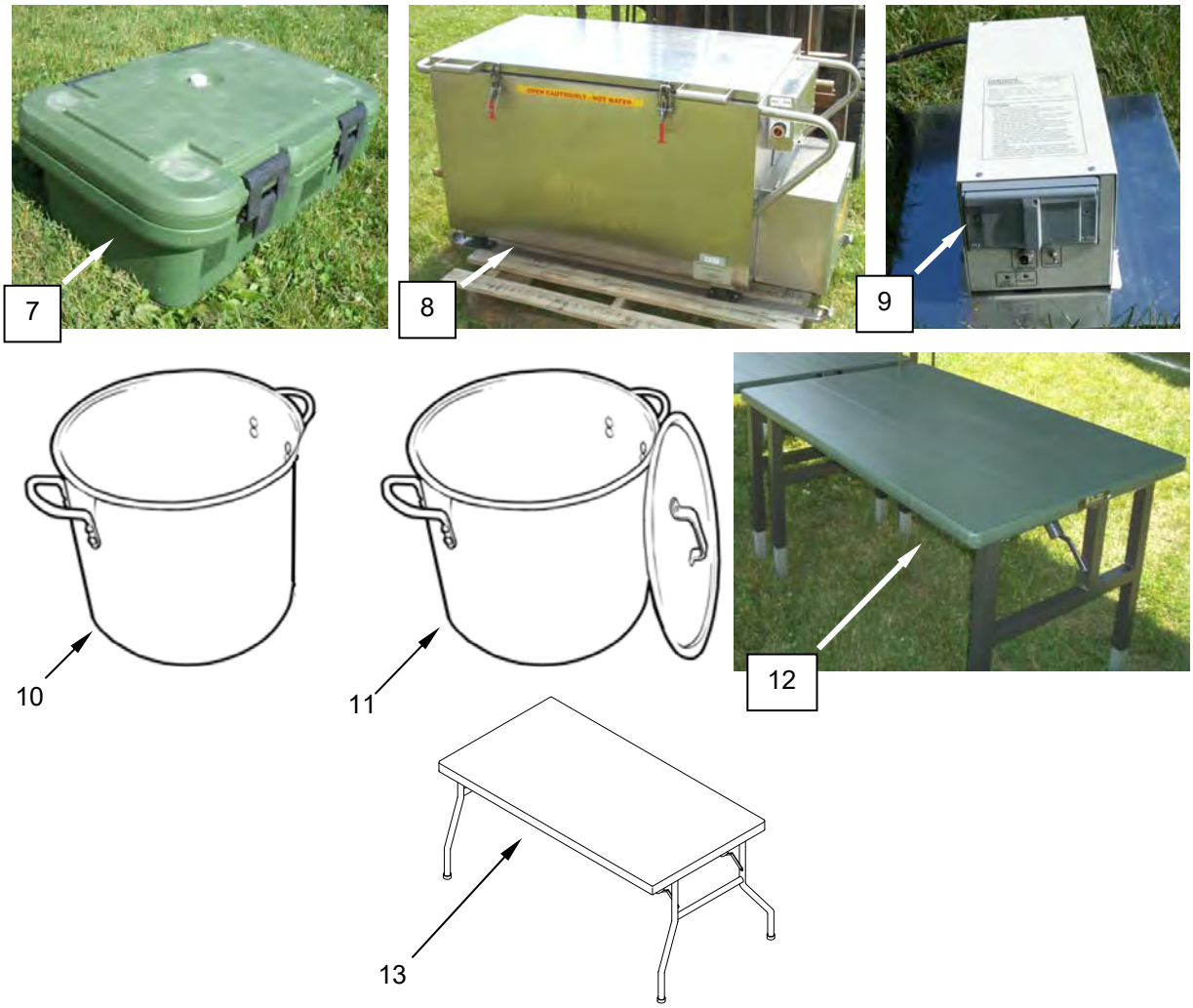


Table 1. Components Of End Item (COEI) List - Continued.

(1) Illus Number	(2) National Stock Number (NSN)	(3) Description, Part Number/(CAGEC)	(4) Usable On Code	(5) U/I	(6) Qty Rqr.
7	7360-01-419-8500	FOOD TRANSPORTER, INSULATED, GREEN (in HMMWV or LTT cargo bed) UPC-160 (58536)	FWW	EA	5
7	7360-01-419-6261	FOOD TRANSPORTER, INSULATED, TAN (in HMMWV or LTT cargo bed) A-A-52193 (58536)	FXC	EA	5
8	7310-01-514-1420	HEATER, TRAY RATION (ARMY ONLY) (in HMMWV or LTT cargo bed) TRH 2000 (04AL0)		EA	1
9	6130-01-493-1792	INVERTER, POWER, STATIC (in HMMWV or LTT cargo bed) DUI-24/300Q (04AL0)		EA	1
10	7330-00-292-2306	POT COOKING, 40 QUARTS (in stockpot cradle) DWG NO. 2-9-35 (81337)		EA	1
11	7330-00-292-2307	POT COOKING (W/ COVER) 60 QUARTS (in stockpot cradle) DWG NO. 2-9-120 (81337)		EA	1
12	7105-01-500-0012	TABLE, FOLDING LEGS, GREEN, 38" X 48" (in HMMWV or LTT cargo bed) A-A-59102-1-E-2 (81337)	FWW	EA	3
12		TABLE, FOLDING LEGS, TAN, 38" X 48" (in HMMWV or LTT cargo bed) A-A-59102-2-E-2 (81337)	FXC	EA	3
13	7105-01-250-0086	TABLE, FOLDING LEGS (MC ONLY) (in HMMWV or LTT cargo bed) 5-13-3751 (81337)	FXC	EA	3

Table 2. Basic Issue Items (BII)

(1) Illus Number	(2) National Stock Number (NSN)	(3) Description, Part Number/(CAGEC)	(4) Usable On Code	(5) U/I	(6) Qty Rqr.
1	7310-01-493-2491	ADAPTER, CAN OPENER (in utensil kit) HMV400 (04AL0)		EA	1
2	7240-21-911-8834	ADAPTER KIT, GRAVITY FEED, MILITARY (in HMMWV or LTT cargo bed) 04957 (36976)		EA	2
3	4730-01-533-8371	ADAPTER, STRAIGHT, PIPE TO GAS FITTING (in maintenance kit) 50785K25 (04AL0)		EA	1
4	5980-01-493-1661	ASSEMBLY, CABLE AND CONDUIT (in maintenance kit) 12990178-1 (19200)		EA	1
5		BURNER DIAGNOSTIC TEST BOX (in maintenance kit) B42000950050 (04AL0)		EA	1
6	7310-01-442-8340	BURNER, MULTI-FUEL (in maintenance kit) B42000950001 (04AL0)		EA	2
7	7420-01-337-5269	CAN, MILITARY, GREEN, 5 GALLONS MIL-C-53109 (81349)	FWW	EA	1
7	7240-01-337-5268	CAN,MILITARY, TAN, 5 GALLONS MIL-C-53109 (81349)	FXC	EA	1

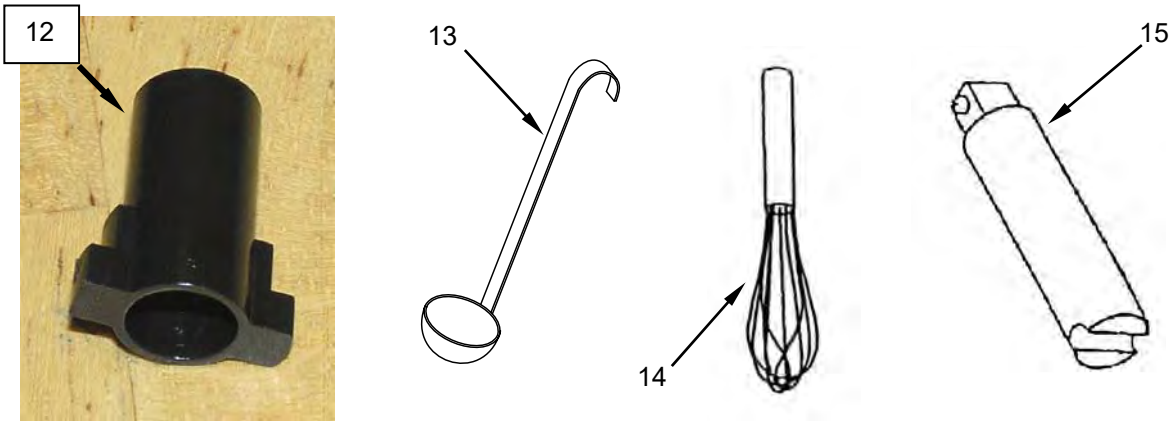


Table 2. Basic Issue Items (BII) - Continued.

(1) Illus Number	(2) National Stock Number (NSN)	(3) Description, Part Number/(CAGEC)	(4) Usable On Code	(5) U/I	(6) Qty Rqr.
8	7240-01-365-5317	CAN, WATER, MILITARY, GREEN, 5 GALLONS (in HMMWV or LTT cargo bed) MIL-C-43613 TYPE 2 (81349)	FWW	EA	8
8	7420-00-089-3827	CAN, WATER, MILITARY, TAN , 5 GALLONS (in HMMWV or LTT cargo bed) MIL-C-43613 TYPE 1 (81349)	FXC	EA	8
9	7310-01-492-9267	CHAMBER, ATOMIZING (in maintenance kit) B42000950027(04AL0)		EA	5
10	4730-00-908-3195	CLAMP, HOSE (in maintenance kit) AA5206-F (58536)		EA	2
11	7310-01-493-1729	CONTROL, FLAME SAFEGUARD (in maintenance kit) B42000950017(04AL0)		EA	1
12	3010-01-492-8203	COUPLING, SHAFT, RIGID (in maintenance kit)B42000950011 (04AL0)		EA	1
13	7330-00-272-2489	DIPPER, KITCHEN (in utensil kit) A-A-1077 (58536)		EA	1
14	7330-00-815-1458	EGG WHIP (in utensil kit) A-A-394 (58536)		EA	1
15	5120-00-227-8107	EXTENSION, SOCKET WRENCH (in tool kit) A-A-2170 (58536)		EA	1

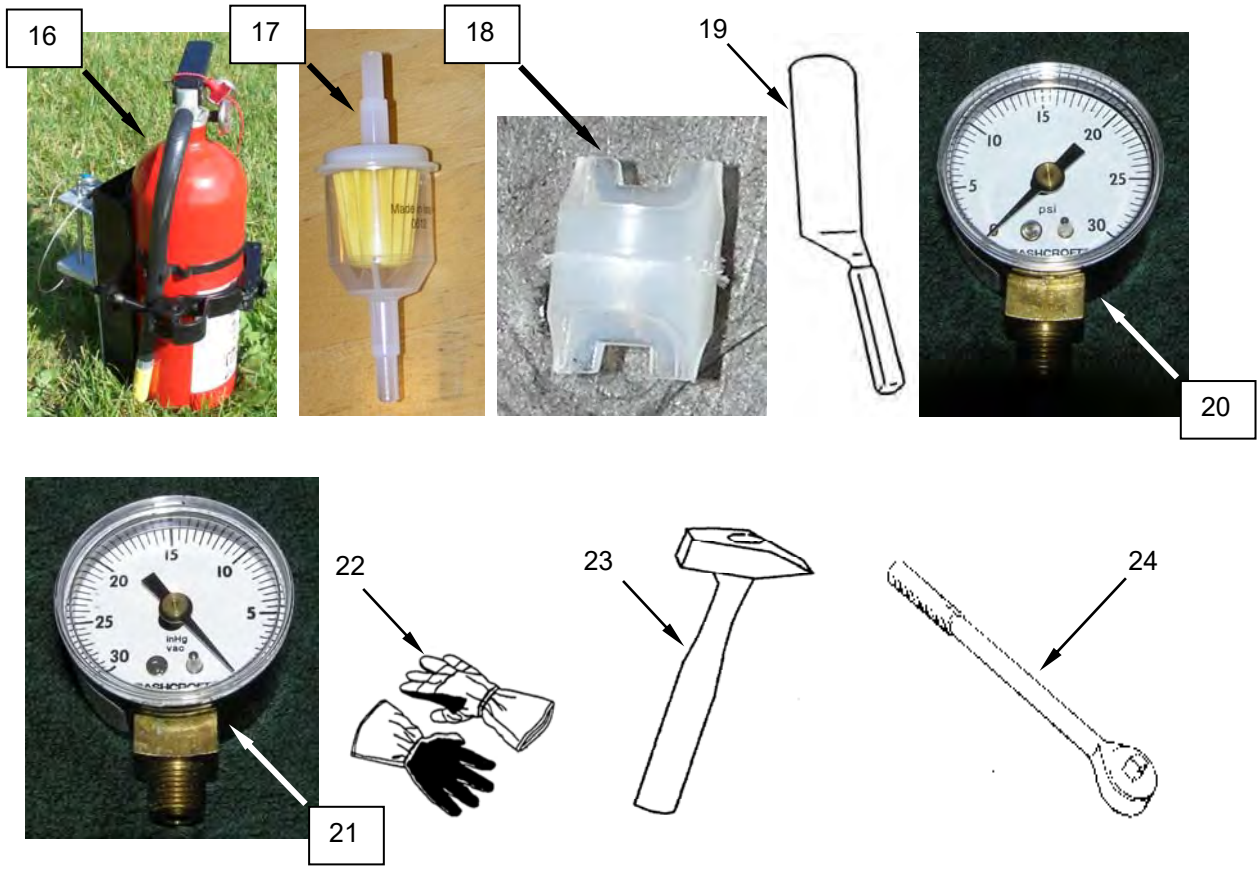


Table 2. Basic Issue Items (BII) - Continued.

(1) Illus Number	(2) National Stock Number (NSN)	(3) Description, Part Number/(CAGEC)	(4) Usable On Code	(5) U/I	(6) Qty Rqr.
16	4210-00-165-4703	EXTINGUISHER, FIRE, DRY CHEMICAL, 5 POUNDS A-A-393 (58536)		EA	1
17	4330-01-533-8771	FILTER ELEMENT, FLUID (in maintenance kit) 71936 (04AL0)		EA	1
18	4310-01-492-8190	FILTER ELEMENT, INTAKE AIR (in maintenance kit) B42000950005 (04AL0)		EA	1
19	7330-00-634-1995	FOOD TURNER (in utensil kit) A-A-1640 (58536)		EA	3
20	6685-01-533-8374	GAUGE, PRESSURE, DIAL INDICATING (in maintenance kit) 3846K34 (04AL0)		EA	2
21	6685-01-533-8686	GAUGE, VACUUM, INDICATING (in maintenance kit) 4002K15 (04AL0)		EA	1
22	8415-01-511-4637	GLOVES, CHEMICAL AND OIL PROTECTIVE (in utensil kit) 17091 (6M644)		EA	4
23	5120-00-242-3915	HAMMER, HAND, 3 POUND (in tool kit) A-A-1292 (58536)		EA	1
24	5120-00-240-5364	HANDLE, SOCKET WRENCH, 3/8 IN (in tool kit) A-A-2165 (58536)		EA	1

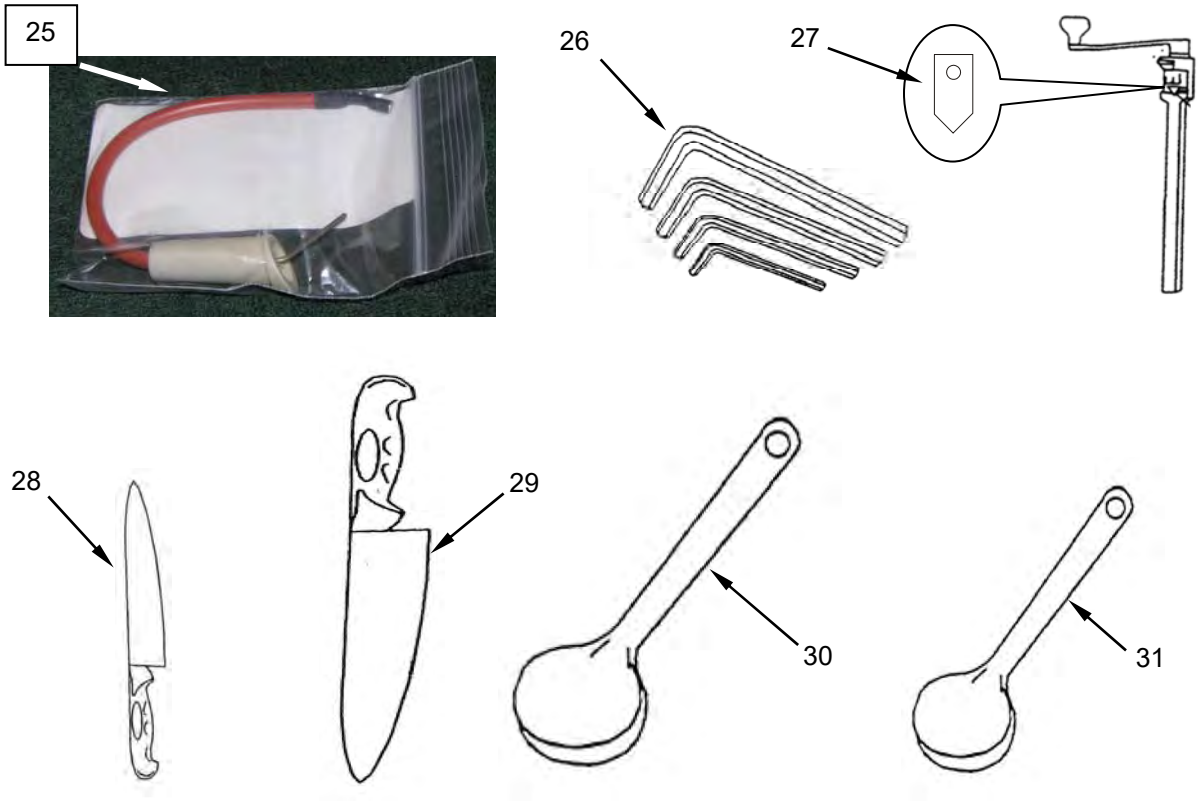


Table 2. Basic Issue Items (BII) - Continued.

(1) Illus Number	(2) National Stock Number (NSN)	(3) Description, Part Number/(CAGEC)	(4) Usable On Code	(5) U/I	(6) Qty Rqr.
25	4520-01-492-6662	IGNITOR, SPARK, FUEL (in maintenance kit) B42000950028 (04AL0)		EA	1
26	5120-00-432-2196	KEY SET, SOCKET HEAD SCREW (in tool kit) B18.3.2M (05047)		EA	1
27	7330-01-234-2204	KNIFE BLADE, CAN OPENER,MOUNTED (in utensil kit) K004 (83190)		EA	2
28	7340-00-197-1271	KNIFE, BONING, SMALL, 6 IN (in utensil kit) GGG-C-746 (81348)		EA	2
29	7340-00-488-7950	KNIFE, COOKS, 8" (in utensil kit)A-A-2733 (58536)		EA	2
30	7330-00-248-1153	LADLE, KITCHEN, 8 OZ (in utensil kit) 7330-00-248-1153 (80244)		EA	2
31	7330-00-680-0865	LADLE, KITCHEN, 4 OZ (in utensil kit) 7330-00-680-0865 (80244)		EA	2

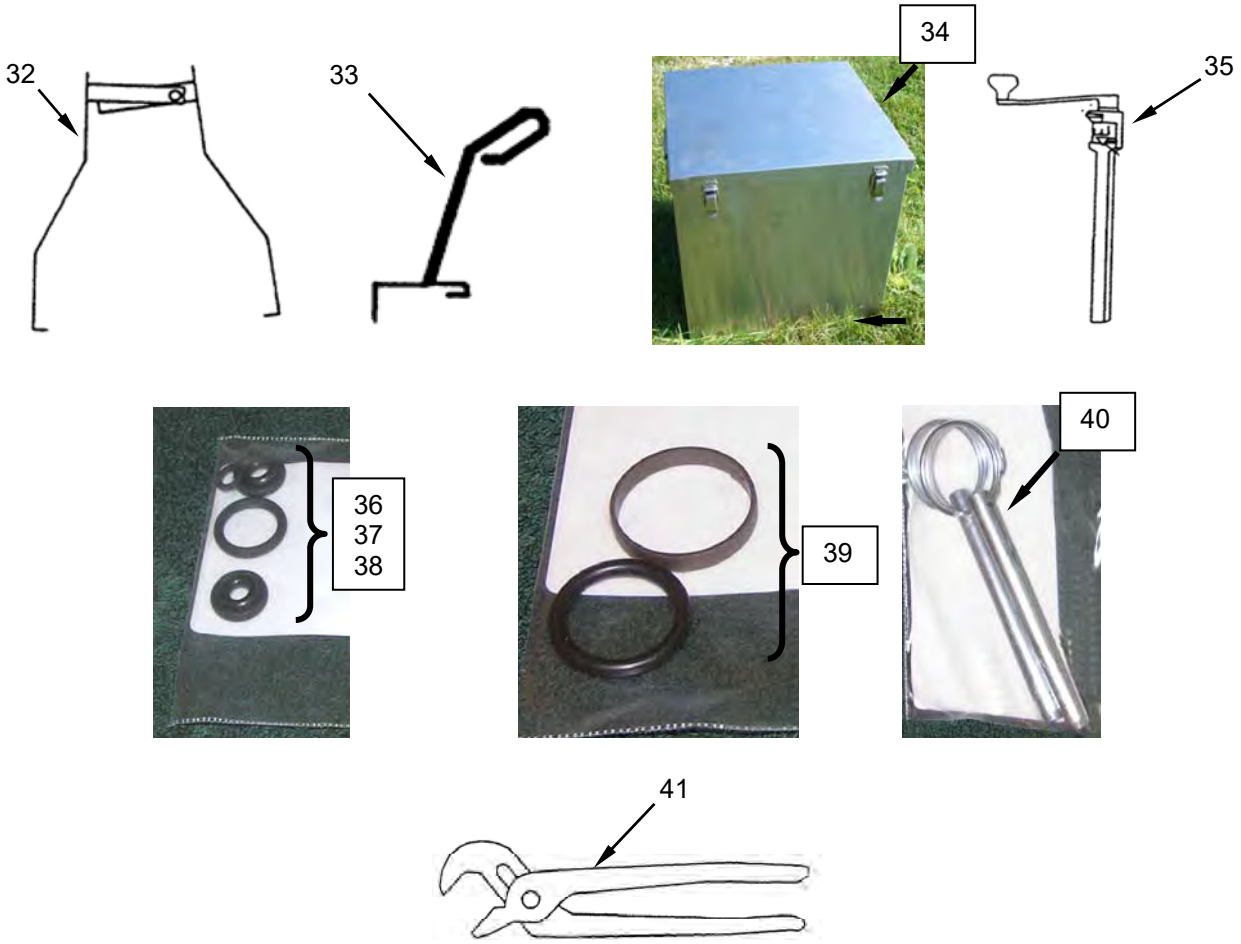
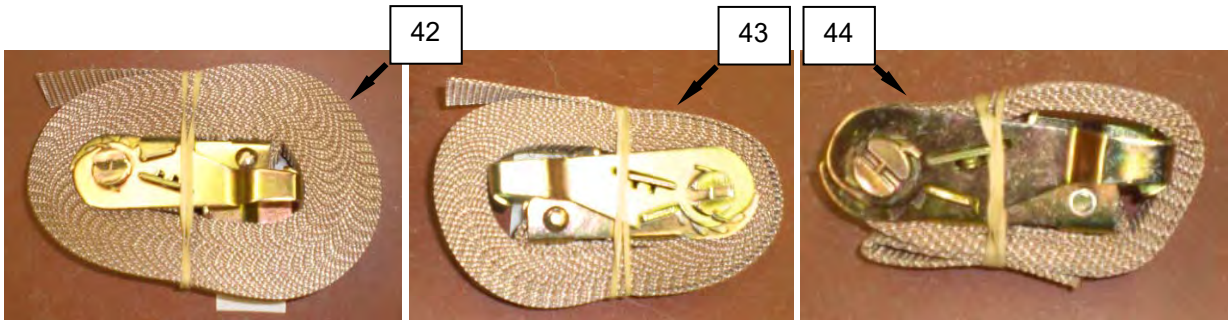


Table 2. Basic Issue Items (BII) - Continued.

(1) Illus Number	(2) National Stock Number (NSN)	(3) Description, Part Number/(CAGEC)	(4) Usable On Code	(5) U/I	(6) Qty Rqr.
32	7310-01-385-6263	LIFTER, SERVING, CAN (in utensil kit)5-13-4265 (81337)		EA	1
33	7330-01-234-2164	LIFTER, TRAY-PACK (in utensil kit) 5-13-3961 (81337)		EA	1
34	7360-01-514-1440	MAINTENANCE KIT, BURNER (in HMMWV or LTT cargo bed, on board spares) TRHMKT (04AL0)		EA	1
35	7330-01-411-9788	OPENER, CAN, MOUNTED (in utensil kit) A-A-52206 (58536)		EA	1
36	5331-01-492-6629	O-RING (in maintenance kit) B42000-95-0046 (04AL0)		EA	4
37	5331-01-533-4279	O-RING (in maintenance kit) 9263K238 (04AL0)		EA	2
38		O-RING, 4.1 mm (in maintenance kit) 9263K135 (04AL0)		EA	2
39	4310-01-492-8182	PARTS KIT, PISTON ASSEMBLY (in maintenance kit) B42000950004 (04AL0)		EA	1
40	5315-01-128-6802	PIN, LOCK (in maintenance kit) 13054541 (18876)		EA	2
41	5120-00-247-5177	PLIERS, 6 in (in tool kit) 67-305 (08292)		EA	1



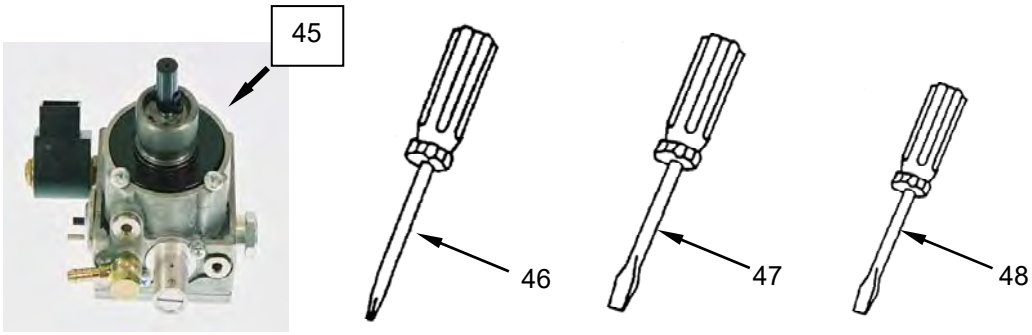


Table 2. Basic Issue Items (BII) - Continued.

(1) Illus Number	(2) National Stock Number (NSN)	(3) Description, Part Number/(CAGEC)	(4) Usable On Code	(5) U/I	(6) Qty Rqr.
42		Webbing Cargo Tie down Endless, WLL 1000# PR1 1"X14' Polyester		EA	17
43		Webbing Cargo Tie down Endless, WLL 1000# PR1 1"X25' Polyester		EA	3
44		Webbing Cargo Tie down Endless, WLL 1000# PR1 1"X5' Polyester		EA	4
45	7310-01-442-2875	PUMP, FUEL, ELECTRICAL (in maintenance kit) B42000950010(04AL0)		EA	1
46	5120-00-234-8913	SCREWDRIVER, CROSS TIP, #2, 4 IN (in tool kit) BD122 (75347)		EA	1
47	5120-00-227-7334	SCREWDRIVER, FLAT TIP, 10 IN (in tool kit) B107.15 (05047)		EA	1
48	5120-00-236-2140	SCREWDRIVER, FLAT-TIP (1/8) 2 IN (in tool kit) A130-2 (75347)		EA	1

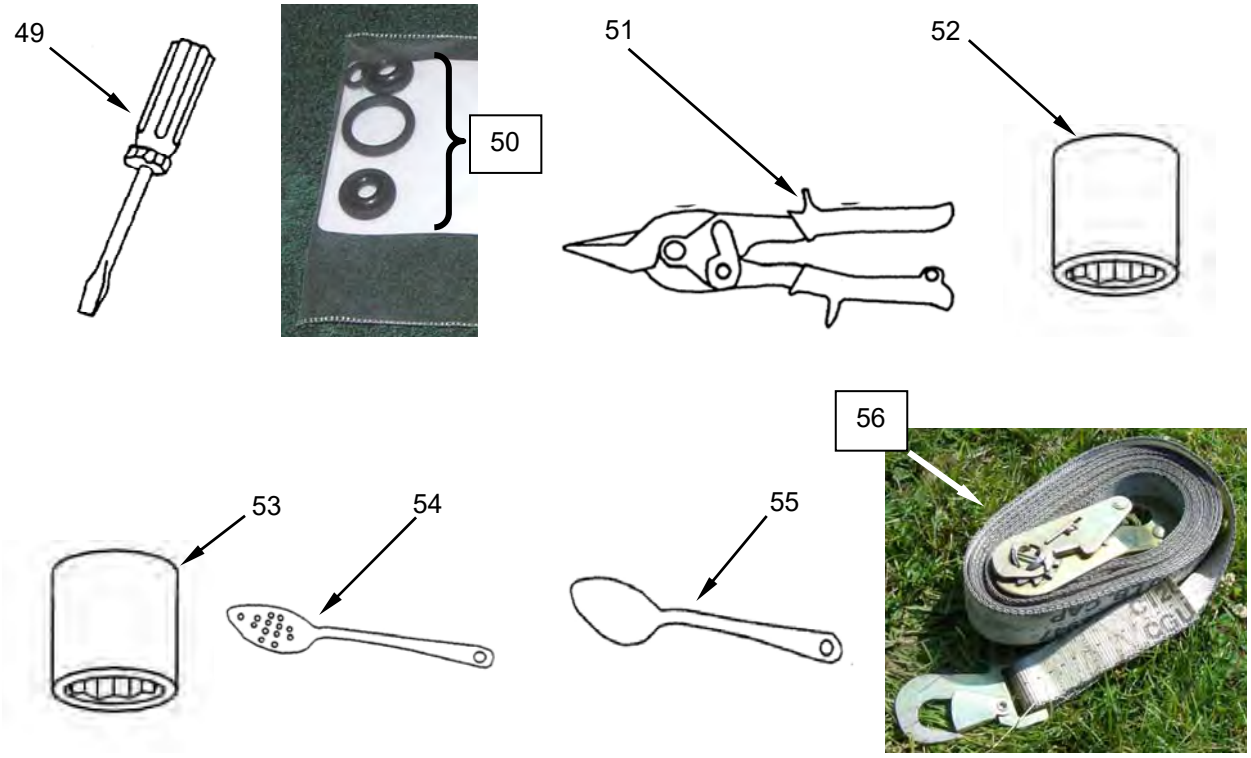


Table 2. Basic Issue Items (BII) - Continued.

(1) Illus Number	(2) National Stock Number (NSN)	(3) Description, Part Number/(CAGEC)	(4) Usable On Code	(5) U/I	(6) Qty Rqr.
49	5120-00-236-2127	SCREWDRIVER, FLAT-TIP (3/16) 6.75 IN (in tool kit) A46398 (66796)		EA	1
50	5331-01-492-6618	SET, O-RING (in maintenance kit) B42000-95-0039 (04AL0)		EA	2
51	5110-00-273-0128	SHEARS, METAL CUTTING, 9.25 IN LG (in utensil kit) B107.16M (05047)		EA	1
52	5120-00-227-6704	SOCKET, SOCKET WRENCH, 9/16 X 3/8 DRIVE (in tool kit) A-A-1404 (58536)		EA	1
53	5120-00-227-6703	SOCKET, SOCKET WRENCH, 7/16 X 3/8 DRIVE (in tool kit) A-A-1404 (58536)		EA	1
54	7330-00-205-1421	SPOON, FOOD SERVICE, SLOTTED, 15 IN (in utensil kit) A-A-1082 (58536)		EA	6
55	7340-00-240-7079	SPOON, FOOD SERVICE, SOLID, 13 IN (in utensil kit) A-A-1082 (58536)		EA	9
56	5340-01-493-2511	STRAP, WEBBING (in HMMWV or LTT cargo bed) CE-TD-001 (04AL0)		EA	3

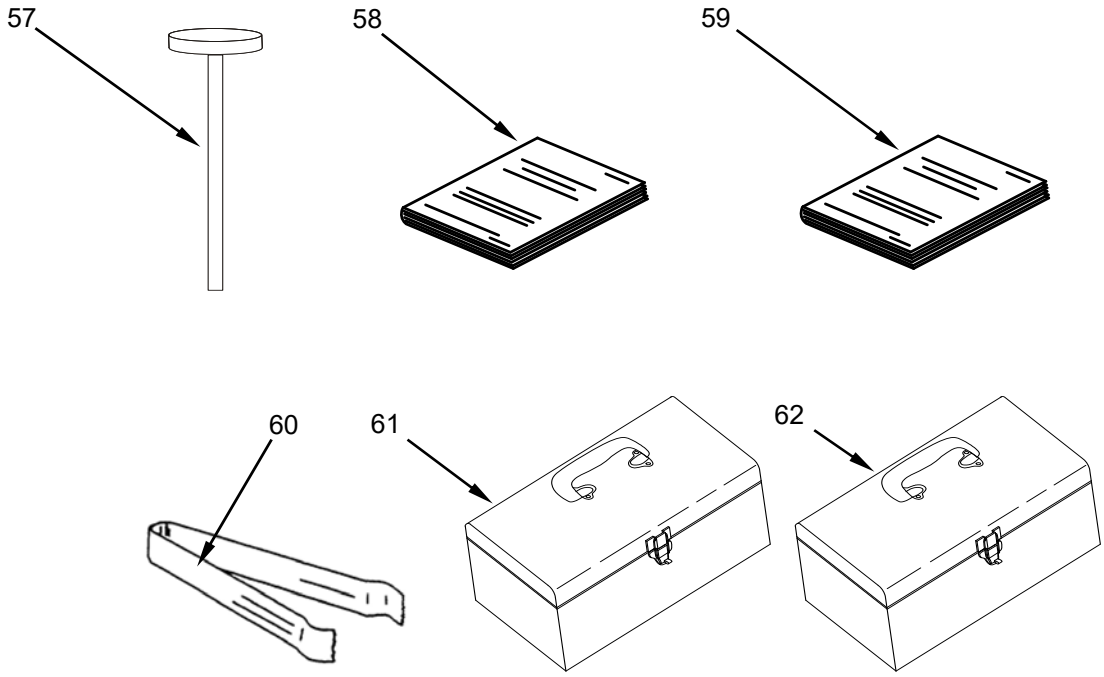


Table 2. Basic Issue Items (BII) - Continued.

(1) Illus Number	(2) National Stock Number (NSN)	(3) Description, Part Number/(CAGEC)	(4) Usable On Code	(5) U/I	(6) Qty Rqr.
57	6685-01-541-1798	THERMOMETER, SELF-INDICATING (in utensil kit) 48041015 (0U5N7)		EA	4
58		TM 10-7310-281-13&P (Operator's, Unit, and Direct Support Maintenance Manual, Including Repair Parts and Special Tools List (RPSTL) for Modern Burner Unit (MBU) NSN 7310-01-452-8137 and Modern Burner Unit (MBU-V3) NSN 7310-01-507-9310 (in HMMWV cab)		EA	1
59		TM 10-7360-230-13&P (OPERATOR AND FIELD MAINTENANCE MANUAL INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST FOR ASSAULT KITCHEN (AK) (in HMMWV cab)		EA	1
60	7330-00-616-0998	TONGS, FOOD SERVING, 9" (in utensil kit) 7330-00-616-0998 (64067)		EA	6
61		TOOL BOX, ASSAULT KITCHEN (holds tool kit components) 8260GY-4 (04AL0)		EA	1
62		TOOL KIT, TRH (Includes tool box and all tools) TRHMKT (04AL0)		EA	1

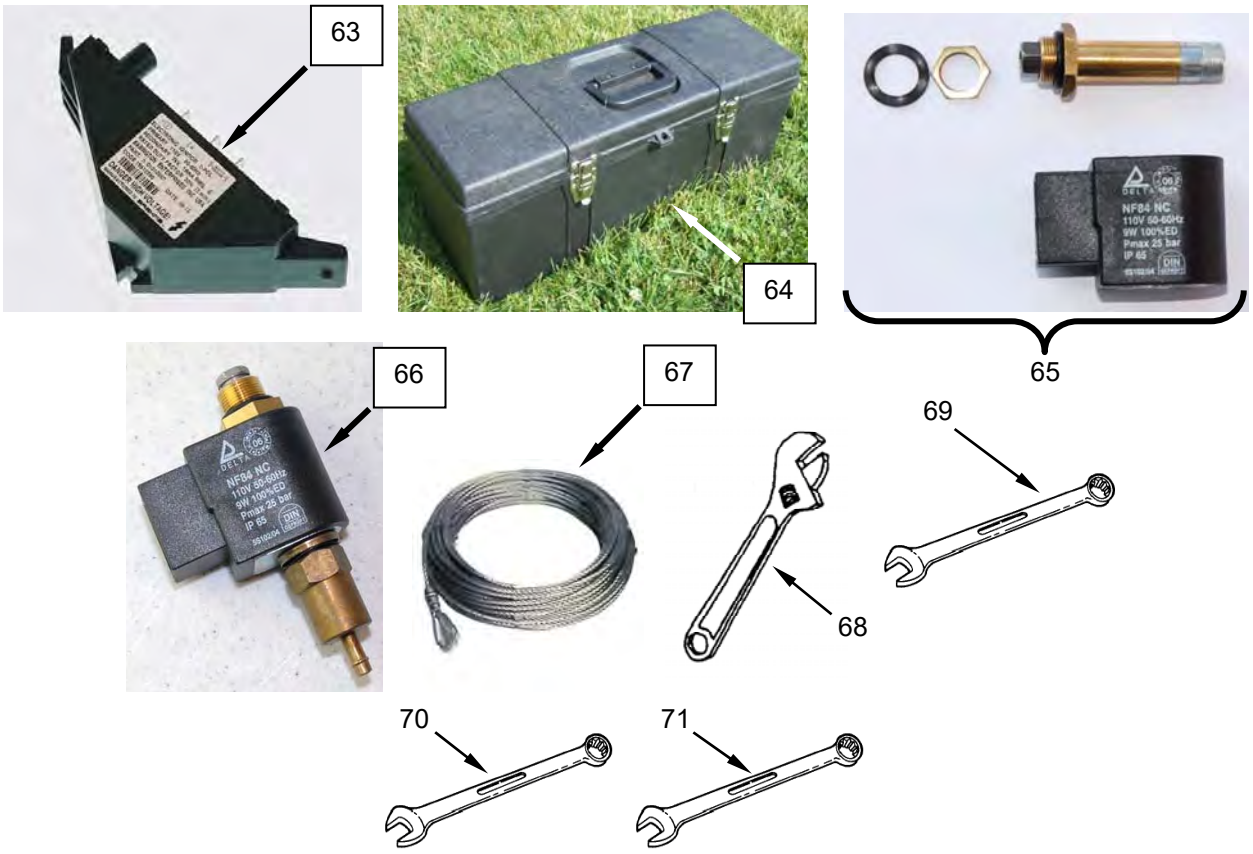


Table 2. Basic Issue Items (BII) - Continued.

(1) Illus Number	(2) National Stock Number (NSN)	(3) Description, Part Number/(CAGEC)	(4) Usable On Code	(5) U/I	(6) Qty Rqr.
63	7310-01-493-1726	TRANSFORMER, IGNITION (in maintenance kit) B42000950029(04AL0)		EA	1
64		UTENSIL BOX, STORAGE (holds utensil kit components) 7716 (04AL0)		EA	1
65	4810-01-533-4207	VALVE, SOLENOID (in maintenance kit) B42005-04-0013 (04AL0)		EA	1
66	7310-01-492-8208	VALVE, SOLENOID (in maintenance kit) B42000950013(04AL0)		EA	1
67	4010-01-533-4957	WIRE ROPE ASSEMBLY, SINGLE LEG (in maintenance kit) 90312A210 (04AL0)		EA	2
68	5120-00-240-5328	WRENCH, ADJUSTABLE A-A-2344 (58536)		EA	1
69	5120-01-349-1477	WRENCH, BOX AND OPEN END, COMBINATION 11MM OEXM110B (55719)		EA	1
70	5120-00-228-9508	WRENCH, BOX AND OPEN END, COMBINATION, 5/8" A-A-1358 (58536)		EA	1
71	5120-01-177-7258	WRENCH, BOX AND OPEN END,COMBINATION, 10MM MKAT10 (04AL0)		EA	1

END OF WORK PACKAGE

OPERATOR AND FIELD MAINTENANCE

ASSAULT KITCHEN
ADDITIONAL AUTHORIZATION LIST (AAL)

INTRODUCTION

Scope

This work package lists additional items you are authorized for the support of the Assault Kitchen.

General

This list identifies items that do not have to accompany the Assault Kitchen and that do not have to be turned in with it. These items are all authorized to you by CTA, MTOE, TDA, or JTA.

Explanation of Columns in the AAL

Column (1) National Stock Number (NSN). Identifies the stock number of the item to be used for requisitioning purposes.

Column (2) Description, Part Number/(CAGEC). Identifies the Federal item name (in all capital letters) followed by a minimum description when needed. The last line below the description is the part number and Commercial and Government Entity Code (CAGEC) (in parentheses).

Column (3) Usable On Code. When applicable, gives you a code if the item you need is not the same for different models of equipment.

Code	Used On
FXC	Assault Kitchen (Tan)
FWW	Assault kitchen (Green)

Column (4) U/I. Unit of Issue (U/I) indicates the physical measurement or count of the item as issued per the National Stock Number shown in column (1).

Column (5) Qty Recm. Indicates the quantity recommended.

Table 1. Additional Authorization List.

(1) National Stock Number (NSN)	(2) Description, Part Number/(CAGEC)	(3) Usable On Code	(4) U/I	(5) Qty Recm
8415-00-963-8087	APRON, RUBBER 6-29 (90808)		EA	1
7310-01-454-1249	BATTERY MS0225 (3AD06)		EA	2
7310-01-453-6565	BATTERY PACK MS0200 (3AD06)		EA	1
7310-01-507-9310	BURNER UNIT, MODERN V3 PD MBU-001 (81349)		EA	1
7310-01-493-2622	CANVAS, FOUL WEATHER CE-FW-001 (04AL0)		EA	1
7310-01-458-5060	EXTENSION CORD, 25FT (110 VAC) MS0425 (3AD06)		EA	1

Table 1. Additional Authorization List - Continued.

(1) National Stock Number (NSN)	(2) Description, Part Number/(CAGEC)	(3) Usable On Code	(4) U/I	(5) Qty Recm
7310-01-454-1281	EXTENSION CORD, 50 FT (110 VAC) MS0400 (3AD06)		EA	1
7310-01-455-3735	FUEL LINE, MBU MS0350 (3AD06)		EA	1
7310-01-455-1017	HARNESS BRANCH, MBU MS0104 (3AD06)		EA	1
6260-01-535-1647	LANTERN, MULTI FUEL MR2 (3G5K6)		EA	1
7310-01-453-6513	POWER CONVERTER FOR MBU MS0150 (3AD06)		EA	1
7360-00-082-2153	RANGE OUTFIT, FIELD, GASOLINE MIL-R-14601 (81349)		EA	1

OPERATOR AND FIELD MAINTENANCE

ASSAULT KITCHEN
EXPENDABLE AND DURABLE ITEMS LIST

INTRODUCTION

Scope

This work package lists expendable and durable items that you will need to operate and maintain the ASSAULT KITCHEN. This list is for information only and is not authority to requisition the listed items. These items are authorized to you by CTA 50-970, Expendable/Durable Items (Except Medical, Class V Repair Parts, and Heraldic Items), CTA 50-909, Field and Garrison Furnishings and Equipment, or CTA 8-100, Army Medical Department Expendable/Durable Items.

Explanations of Columns in Expendable/Durable Items List

Column (1) Item No. This number is assigned to the entry in the list and is referenced in the narrative instructions to identify the item (e.g., Use brake fluid (WP 0098, Item 5)).

Column (2) Level. This column includes the lowest level of maintenance that requires the listed item (C = Crew, O = Service/AMC, F = Field/ASB).

Column (3) National Stock Number (NSN). This is the NSN assigned to the item which you can use to requisition it.

Column (4) Item Name, Description, Part Number/(CAGEC). This column provides the other information you need to identify the item. The last line below the description is the part number and the Commercial and Government Entity Code (CAGEC) (in parentheses).

Column (5) U/I. Unit of Issue (U/I) code shows the physical measurement or count of an item, such as gallon, dozen, gross, etc.

Table 1. Expendable and Durable Items List.

(1) Item No.	(2) Level	(3) National Stock Number (NSN)	(4) Item Name, Description, Part Number/(CAGEC)	(5) U/I
1	C	7930-01-363-8631	ABSORBENT MATERIAL, OIL AND WATER (IJA49) MAT203	BG
2	C	8105-01-221-3239	BAG, PLASTIC, CONTAMINATED WASTE, SIZE 3 (58536) A-A-2299	RO
3	C	7920-00-061-0038	BRUSH, SCRUB (58536) A-A-2074	EA
4	C	5940-00-665-7317	SPLICE, CONDUCTOR, # 18-22 (00779) 1-34070-1	EA
5	C	6850-00-965-2280	DESICCANT, ACTIVATED (81349) MIL-D-3464	BG
6	C	7930-00-985-6911	DETERGENT, GENERAL PURPOSE, MILD (81349) MIL-D-16791	GL
7	C	6545-00-919-6650	FIRST AID KIT, GENERAL PURPOSE (64616) IRR A-6882	EA
8	C	6545-00-656-1094	FIRST AID KIT, GENERAL PURPOSE (80244) GG-K-391 TYPE 3	EA

Table 1. Expendable and Durable Items List.

(1) Item No.	(2) Level	(3) National Stock Number (NSN)	(4) Item Name, Description, Part Number/(CAGEC)	(5) U/I
9	O	8415-00-009-1900	GLOVES, CHEMICAL AND OIL PROTECTIVE (86523) N36	PR
10	O	4240-00-190-6432	GOGGLES, INDUSTRIAL (58536) A-A-1110	PR
11	C	9150-00-529-7518	OIL, PENETRATING (81348) A-A-50493	CN
12	C	7920-00-659-9175	PAD, SCOURING (80244) L-P-0050TY1SZ1	PK
13	C	7920-00-205-1711	RAG, WIPING (58536) A-A-2522	BE
14	F	5320-01-177-7940	RIVET, POP (90915) 90004155	LB
15	F	3439-01-532-1787	ROD, WELDING, STAINLESS (34920) 308LT30	CO
16	O	9160-01-515-2484	SEALANT, RTV (45152) 3119525	EA
17	O	5975-00-074-2072	STRAPS, TIEDOWN, ELECRTRICAL COMPONENT (81343) MS3367-1-9	HD
18	O	5970-00-644-3167	TAPE, ELECTRICAL INSULATION, ¾ INCH WIDTH (58536) A-A-2094	RO
19	C	4920-01-212-9235	TAPE, TEFLON (22380) 2325179	RO
20	O	8945-01-529-6771	VEGETABLE OIL (54027) VEGETABLE OIL	CO

END OF WORK PACKAGE

OPERATOR AND FIELD MAINTENANCE

ASSAULT KITCHEN
TOOL IDENTIFICATION LIST

INTRODUCTION

Scope

This work package lists all common tools and supplements and special tools/fixtures needed to maintain the Assault Kitchen.

Explanation of Columns in the Tool Identification List

Column (1) Item No. This number is assigned to the entry in the list and is referenced in the initial setup to identify the item (e.g., “Extractor (WP 0091, Item 17)”).

Column (2) Item Name. This column lists the item by noun nomenclature and other descriptive features (e.g., Gage, belt tension).

Column (3) National Stock Number (NSN). This is the National Stock Number (NSN) assigned to the item; use it to requisition the item.

Column (4) Part Number/(CAGEC). Indicates the primary number used by the manufacturer (individual, company, firm, corporation, or Government activity) which controls the design and characteristics of the item by means of its engineering drawings, specifications, standards, and inspection requirements to identify an item or range of items. The manufacturer’s Commercial and Government Entity Code (CAGEC) is also included.

Column (5) Reference. This column identifies the authorizing supply catalog or RPSTL for items listed in this work package.

Table 1. Assault Kitchen Tool Identification List.

(1) Item No.	(2) Item Name	(3) National Stock Number	(4) Part Number/ (CAGEC)	(5) Reference
1	Maintenance Kit (Included within the silver metallic TRH Maintenance Kit)	7360-01-514-1440	TRHMKT (04AL0)	TM 10-7360-230-13&P
2	Pliers, Slip-Joint (Located inside HMMWV tool bag)	5120-00-223-7397	11655775-3 (19207)	TM 10-7360-230-13&P
3	Tool Kit (included inside the black metallic tool box)			TM 10-7360-230-13&P
4	Tool Kit, General Mechanic’s: Automotive (GMTK)	5180-01-483-0249	12B470000-1 (59678)	TM 10-7360-230-13&P
5	Tool Set, SATS, Base	4910-01-490-6453	SC 4910-95-A81 (59678)	TM 10-7360-230-13&P
6	Welding Machine, Arc (TIG) (LIN 47707)	3431-00-235-4728	903 220 (40608)	TM 10-7360-230-13&P

END OF WORK PACKAGE

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Group 0113, Burner, Multi-Fuel ..... WP 0054
Group 02, Cradle Assembly, Cooking Pot ..... WP 0055
Group 03, Ancillary Equipment ..... WP 0056
Group 04, Hardware and Cables ..... WP 0055
Repair Parts and Special Tools List (RPSTL), Introduction ..... WP 0052

S

Service Upon Receipt, Army ..... WP 0013
Service Upon Receipt, Marine Corps ..... WP 0016
Shipment, Preparation for ..... WP 0048
Storage, Preparation for ..... WP 0048

T

Theory of Operation ..... WP 0003
Tool Identification List ..... WP 0066
TRH Operations ..... WP 0006

These are the instructions for sending an electronic 2028

The following format must be used if submitting an electronic 2028. The subject line must be exactly the same and all fields must be included; however only the following fields are mandatory: 1, 3, 4, 5, 6, 7, 8, 9, 10, 13, 15, 16, 17, and 27.

From: "Whomever" <whomever@avma27.army.mil>
To: amssbriml@natick.army.mil

Subject: DA Form 2028

1. From: Joe Smith
2. Unit: home
3. Address: 4300 Park
4. City: Hometown
5. St: MO
6. Zip: 77777
7. Date Sent: 19-OCT-93
8. Pub no: 55-2840-229-23
9. Pub Title: TM
10. Publication Date: 04-JUL-85
11. Change Number: 7
12. Submitter Rank: MSG
13. Submitter FName: Joe
14. Submitter MName: T
15. Submitter LName: Smith
16. Submitter Phone: 123-123-1234
17. Problem: 1
18. Page: 2
19. Paragraph: 3
20. Line: 4
21. NSN: 5
22. Reference: 6
23. Figure: 7
24. Table: 8
25. Item: 9
26. Total: 123
27. Text:

This is the text for the problem below line 27.

RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS For use of this form, see AR 25-30; the proponent agency is ODISC4.	Use Part II *(reverse)* for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).	DATE 21 October 2003

TO: *(Forward to proponent of publication or form) (Include ZIP Code)* US ARMY TACOM LIFE CYCLE MANAGEMENT COMMAND ATTN: AMSTA-LC-LMPP/TECH PUBS 1 Rock Island Arsenal Rock Island, IL 61299-7630	FROM: *(Activity and location) (Include ZIP Code)* *PFC JANE DOE* *Co A 3RD Engineer Br.* *Ft Leonard Wood, MO 63108*

PART I – ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS

PUBLICATION/FORM NUMBER	DATE	TITLE
TM 10-1670-296-23&P	30 October 2002	Unit Manual for Ancillary Equipment for Low Velocity Air Drop Systems

ITEM NO.	PAGE NO.	PARA-GRAPH	LINE NO. *	FIGURE NO.	TABLE NO.	RECOMMENDED CHANGES AND REASON *(Provide exact wording of recommended changes, if possible).*
	0036 00-2				1	*In Table 1, Sewing Machine Code Symbols, the second sewing machine code symbol should be MDZZ not MD22* *Change the manual to show Sewing Machine, Industrial: Zig-Zag; 308 stitch; medium-duty; NSN 3530-01-181-1421 as a MDZZ code symbol.*

**Reference to line numbers within the paragraph or subparagraph.*

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE
Jane Doe, PFC	(508) 233-4141 DSN 256-4141	Jane Doe *Jane Doe*

DA FORM 2028, FEB 74 REPLACES DA FORM 2028, 1 DEC 68, WHICH WILL BE USED. USAPPC V3.00

SAMPLE

TO: (*Forward direct to addressee listed in publication*)	FROM: (*Activity and location) (Include ZIP Code)*	DATE
US ARMY TACOM LIFE CYCLE MANAGEMENT ATTN: AMSTA-LC-LMPP/TECH PUBS 1 Rock Island Arsenal Rock Island, IL 61299-7630	*PFC JANE DOE* *Co A 3RD Engineer Br.* *Ft Leonard Wood, MO 63108*	21 October 2003

PART II – REPAIR PARTS AND SPECIAL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS

PUBLICATION NUMBER	DATE	TITLE
TM 10-1670-296-23&P	30 October 2002	Unit Manual for Ancillary Equipment for Low Velocity Air Drop Systems

PAGE NO.	COLM NO.	LINE NO.	NATIONAL STOCK NUMBER	REFERENCE NO.	FIGURE NO.	ITEM NO.	TOTAL NO. OF MAJOR ITEMS SUPPORTED	RECOMMENDED ACTION
0066 00-					4			*Callout 16 in figure 4 is pointed to a D-Ring.In the Repair Part List key for Figure 4, item 16 is called a Snap Hook. Please correct one or the other.*

PART III – REMARKS (*Any general remarks or recommendations, or suggestions for improvement of publications and blank forms. Additional blank sheets may be used if more space is needed.)*

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE

SAMPLE

RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS

For use of this form, see AR 25-30; the proponent agency is ODISC4.

Use Part II *(reverse)* for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).

DATE

TO: *(Forward to proponent of publication or form) (Include ZIP Code)*
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Rock Island, IL 61299-7630

FROM: *(Activity and location) (Include ZIP Code)*

PART I – ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS

PUBLICATION/FORM NUMBER	DATE	TITLE
TM 10-7360-230-13&P	27 February 2009	Operator and Field Maintenance Manual, including Repair Parts and Special Tools List (RPSTL) for Army Kitchen Module (Assault)

ITEM NO.	PAGE NO.	PARA-GRAPH	LINE NO. *	FIGURE NO.	TABLE NO.	RECOMMENDED CHANGES AND REASON *(Provide exact wording of recommended changes, if possible).*

**Reference to line numbers within the paragraph or subparagraph.*

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE

TO: *(Forward to proponent of publication or form) (Include ZIP Code)*	**FROM:** (*Activity and location) (Include ZIP Code)*	**DATE**
US ARMY TACOM LIFE CYCLE MANAGEMENT COMMAND ATTN: AMSTA-LC-LMPP/TECH PUBS 1 Rock Island Arsenal Rock Island, IL 61299-7630		

PART II – REPAIR PARTS AND SPECIAL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS

PUBLICATION/FORM NUMBER	DATE	TITLE
TM 10-7360-230-13&P	27 February 2009	Operator and Field Maintenance Manual, including Repair Parts and Special Tools List (RPSTL) for Army Kitchen Module (Assault)

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PART III – REMARKS (*Any general remarks or recommendations, or suggestions for improvement of publications and blank forms. Additional blank sheets may be used if more space is needed.)*

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RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS

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Use Part II *(reverse)* for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).

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Rock Island, IL 61299-7630

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TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE

ARMY TM 10-7360-230-13&P
MARINE CORPS TM 09211A-OR

By Order of the Secretary of the Army:

GEORGE W. CASEY, JR.
General, United States Army
Chief of Staff

Official:

JOYCE E. MORROW
Administrative Assistant to the
Secretary of the Army
0904102

A.J. PASAGIAN
LTC, UMSC
PROGRAM MANAGER/
INFANTRY COMBAT EQUIPMENT
Marine Corps System Command

DISTRIBUTION:
To be distributed in accordance with initial distribution number (IDN) 256988 requirements for TM 10-7360-230-13&P.

The Metric System and Equivalents

Linear Measure

1 centimeter = 10 millimeters = .39 inch
1 decimeter = 10 centimeters = 3.94 inches
1 meter = 10 decimeters = 39.37 inches
1 dekameter = 10 meters = 3 2.8 feet
1 hectometer = 10 dekameters = 328.08 feet
1 kilometer = 10 hectometers = 3,280.8 feet

Liquid Measure

1 centiliter = 10 milliliters = .34 fl. ounce
1 deciliter = 10 centiliters = 3.38 fl. ounces
1 liter = 10 deciliters = 33.81 fl. ounces
1 dekaliter = 10 liters = 2.64 gallons
1 hectoliter = 10 dekaliters = 26.42 gallons
1 kiloliter = 10 hectoliters = 264.18 gallons

Weights

1 centigram = 10 milligrams = .15 grain
1 decigrarn = 10 centigrams = 1.54 grains
1 gram = 10 decigrams = .035 ounce
1 dekagrarn = 10 grams = .35 ounce
1 hectogram = 10 dekagrams = 3.52 ounces
1 kilogram = 10 hectograms = 2.2 pounds
1 quintal = 100 kilograms = 220.46 pounds
1 metric ton = 10 quintals = 1.1 short tons

Square Measure

1 sq. centimeter = 100 sq. millimeters = .15 5 sq. inch
1 sq. decimeter =100 sq. centimeters = 15.5 sq. inches
1 sq. meter (centare) = 100 sq. decimeters = 10.76 sq. feet
1 sq. dekameter (are) = 100 sq. meters = 1,076.4 sq. feet
1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47 acres
1 sq. kilometer = 100 sq. hectometers = .386 sq. mile

Cubic Measure

1 cu. centimeter = 1000 cu. millimeters = .06 cu. inch
1 cu. decimeter = 1000 cu. centimeters = 61.02 cu. inches
1 cu. meter = 1000 cu. decimeters = 35.31 feet

Approximate Conversion Factors

To change	*To*	*Multiply by*	*To change*	*To*	*Multiply by*
inches	centimeters	2.540	ounce-inches	newton-meters	.007062
feet	meters	.305	centimeters	inches	.394
yards	meters	.914	meters	feet	3.280
miles	kilometers	1.609	meters	yards	1.094
square inches	square centimeters	6.451	kilometers	miles	.621
square feet	square meters	.093	square centimeters	square inches	.155
square yards	square meters	.836	square meters	square feet	10.764
square miles	square kilometers	2.590	square meters	square yards	1.196
acres	square hectometers	.405	square kilometers	square miles	.386
cubic feet	cubic meters	.028	square hectometers	acres	2.471
cubic yards	cubic meters	.765	cubic meters	cubic feet	35.315
fluid ounces	milliliters	29.573	cubic meters	cubic yards	1.308
pints	Iiters	.473	milliliters	fluid ounces	.034
quarts	Iiters	.946	liters	pints	2.113
gallons	Iiters	3.785	liters	quarts	1.057
ounces	grams	28.349	liters	gallons	.264
pounds	kilograms	.454	grams	ounces	.035
short tons	metric tons	.907	kilograms	pounds	2.205
pound-feet	newton-meters	1.356	metric tons	short tons	1.102
pound-inches	newton-meters	.11296			

Temperature (Exact)

_F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	_C

PIN: 085410-000

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